



RESEARCH CENTER

FIELD

**Applied Mathematics, Computation
and Simulation**

Activity Report 2016

Section Dissemination

Edition: 2017-08-25

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ACUMES Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

- P. Goatin was member of the scientific committee of “*PED2016 - Conference on Pedestrian and Evacuation Dynamics*”, Hefei (China), October 2016.
- P. Goatin is member of the the scientific committee of the annual seminar CEA-GAMNI “*Numerical fluid-mechanics*”.
- A. Habbal was member of the scientific committee of the *CARI 2016 Colloque Africain sur la Recherche en Informatique et Mathematiques Appliquees*, Tunis (Tunisia) 10-14 October 2016.

9.1.1.2. Member of the Organizing Committees

- P. Goatin organized the Workshop “*TRAM3 Terminus*”, Sophia Antipolis (France), January 2016.
- R. Duvinneau was co-organizer of the mini-symposium "Surrogate Models for Efficient Robust Optimization and Data Assimilation in Computational Mechanics", part of SIAM Conference on Uncertainty Quantification, Lausanne, April 2016.

9.1.2. Journal

9.1.2.1. Reviewer - Reviewing Activities

- J.-A. Désidéri has made reviews for the *International Journal of Information Technology & Decision Making*, and *Comptes Rendus de l'Académie des Sciences*,
- R. Duvinneau is a reviewer for the following international journals : *Computers & Fluids*, *International Journal for Numerical Methods in Fluids*, *Computer Methods for Applied Mechanical Engineering*, *Computer Aided Geometric Design*, *Applied Mathematics & Mechanics*, *Engineering Optimization*.
- P. Goatin is reviewers for the following international journals: *Acta Applicandæ Mathematicæ* ; *African Journal of Mathematics and Computer Science Research*; *Algorithms*; *Annales de l'Institut Henri Poincaré (C) Analyse Non Linéaire*; *Applied Mathematics and Computation*; *Computer-aided Civil and Infrastructure Engineering*; *Discrete and Continuous Dynamical Systems*; *European Journal of Operational Research*; *IEEE Transactions on Automatic Control*; *IEEE Transactions on Intelligent Transportation Systems*; *International Journal of Dynamical Systems and Differential Equations*; *Journal of Computational Physics*; *Journal of Flow, Turbulence and Combustion*; *Mathematical Models and Methods in Applied Sciences*; *Mathematics of Computation*; *Networks and Heterogeneous Media*; *New Journal of Physics*; *Nonlinear Analysis Ser. B: Real World Applications*; *SIAM Journal of Mathematical Analysis*; *SIAM Journal of Applied Mathematics*; *SIAM Journal of Numerical Analysis*; *SIAM Journal on Scientific Computing*.
- A. Habbal is reviewer for the following international journals: *Applied Mathematics (AM)*, *Scientific Research Publishing* ; *Journal of Structural and Multidisciplinary Optimization* ; *Journal of Math. Model. Nat. Phenom.* ; *International Journal of Mechanical Sciences* ; *Modern Applied Science* ; *Asian Journal of Control* ; *Applied Mathematics and Computation* ; *Computer Methods in Applied Mechanics and Engineering* ; *Bulletin of Mathematical Biology* ; *Journal of Pure and Applied Functional Analysis* ; *AMS reviews*.

9.1.3. Invited Talks

- J.-A. Désidéri: ONERA Palaiseau, April 2016.
Invited talk: “*Multiple Gradient Descent Algorithm for Multiobjective Optimization*”,
- R. Duvigneau: Ecole Navale, Brest, January 2016.
Invited talk: “*The Sensitivity Equation Method for optimization, fast estimation of neighboring solutions and uncertainty propagation*”.
- R. Duvigneau: Ecole des Mines Paris-Tech, Sophia-Antipolis, June 2016.
Invited talk: “*Optimization of complex fluid systems using a statistical learning strategy*”.
- P. Goatin: EU-US Frontiers of Engineering Symposium, Helsinki (Finland), October 2016.
Session: “The road to future urban mobility”.
Invited talk: “*Traffic management by macroscopic models*”.
- P. Goatin: SIMAI 2016 - XIII Congress of the Italian Society of Industrial and Applied Mathematics, Milano (Italy), September 2016.
Mini-symposium: “Analysis and numerics for the modeling through conservation laws”.
Invited talk: “*A Riemann Solver at junctions preserving priorities*”.
Mini-symposium: “Mean-field models in pedestrian dynamics”.
Invited talk: “*Non-local macroscopic models of traffic flow*”.
- P. Goatin: 11th Meeting on Nonlinear Hyperbolic PDEs and Applications, Trieste (Italy), June 2016.
Invited talk: “*Conservation laws with local constraints arising in traffic modeling*”.
- P. Goatin: SIAM Conference on Uncertainty Quantification, Lausanne (Switzerland), April 2016.
Mini-symposium: “Data-driven methods for uncertainty quantification”.
Invited talk: “*Parametric uncertainty in macroscopic traffic flow models calibration from GPS data*”.
- P. Goatin: Workshop “Analysis and control on networks: trends and perspectives”, Padova (Italy), March 2016.
Invited talk: “*Optimization based control of networks of discretized PDEs: Application to road traffic management*”.
- P. Goatin: ANR HJNet 5th Meeting, Tours (France), January 2016.
Invited talk: “*Conservation laws with local and unilateral flux constraints*”.
- A. Habbal: IX NPU-UTC Sino-French Seminar on Virtual Prototyping for Design and Fabrication, 11-15 April 2016.
Invited talk: “*Pareto optimality and game equilibria, two approaches to solve multiobjective optimization*”.
- A. Habbal: Lorentz Center workshop SAMCO: Surrogate-Assisted Multi-Criteria Optimization, February 29 - March 4, 2016.
Invited senior participant: “*Many objectives and selection algorithms*”.

9.1.4. Scientific Expertise

J.-A. Désidéri has been a consultant for ONERA (since 2007) at DMFN-Châtillon (Dept. of Numerical Fluid Mechanics) and DAAP-Meudon (Dept. of Applied Aerodynamics), and also directs a thesis at DADS-Châtillon (Dept. of Aeroelasticity and Structural Dynamics).

9.1.5. Research Administration

- P. Goatin is member of BCP (“Bureau du Comité des Projets”) at Inria Sophia Antipolis Méditerranée.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Master: Advanced Optimization, 40.5 hrs, M2, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (J.-A. Désidéri, R. Duvigneau).

Master: Conservation laws and finite volume scheme, 30 hrs, M2, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (P. Goatin).

Master: Multidisciplinary Optimization, 22.5 hrs, joint *Institut Supérieur de l’Aéronautique et de l’Espace* (ISAE Supaéro, "Complex Systems") and M2 (Mathematics), Toulouse (J.-A. Désidéri, R. Duvigneau).

Licence: Summer Project in Mathematical Modeling, 36 hrs, L3, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal).

Master: Numerical Methods for Partial Differential Equations, 66 hrs, M1, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal and R. Duvigneau).

Master: Concurrent design in building structures, M2 Students Project, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal).

9.2.2. Supervision

PhD in progress : Cédric Durantin, *Meta-modelling for the optimization of nanophotonic devices*, October 2014. Supervisors : J.-A. Désidéri and A. Glière (CEA LETI).

PhD in progress : Quentin Mercier, *Multicriterion optimization under uncertainties : the stochastic multiple gradient approach. Application to aerelasticity*, October 2015. Supervisors : J.-A. Désidéri and F. Poirion.

PhD in progress : Maroua Mokni, *Development, analysis and numerical evaluation of MGDA*, October 2013. Supervisors : J.-A. Désidéri and M. Ayadi (LAMSIN-ENIT, Tunisia).

PhD in progress : Sosina Mengistu-Gashaw (EURECOM), *Mobility and connectivity modelling of 2-wheels traffic for ITS applications*, March 2015. Supervisors: P. Goatin and J. Härrı (EURECOM).

PhD in progress: Boutheina Yahyaoui, *Validation of mecano-chemo-biological models for cell sheet wound closure*, Jan 2013, Supervisors: A. Habbal, Mekki Ayadi (LAMSIN, ENIT, Tunis)

PhD in progress: Rabeb Chamekh, *Game strategies for thermo-elasticity*, Jan 2015, Supervisors: A. Habbal, Moez Kallel (LAMSIN, ENIT, Tunis)

PhD in progress: Kelthoum Chahour, *Modeling and optimal design of coronary angioplastic stents*, Nov 2015, Supervisors: A. Habbal, Rajae Aboulaich (LERMA, EMI, Rabat)

PhD in progress: A. Azaouzi, *isogeometric analysis methods for hyperbolic systems*, ENIT (Tunisia) / University of Nice - Sophia Antipolis, Oct. 2013, supervisors: R. Duvigneau and M. Moakher (ENIT).

PhD in progress: M. Sacher, *advanced methods for numerical optimization of yacht performance*, Ecole Navale, Oct. 2014, supervisors: R. Duvigneau, O. Le Maitre (LIMSI), F. Hauville and J.-A. Astolfi (Ecole Navale).

PhD in progress: C. Fiorini, *Sensitivity equation method for hyperbolic systems*, Univ. Versailles, Oct. 2014, supervisors: R. Duvigneau, C. Chalons (Univ. Versailles).

PhD in progress : Nicolas Laurent-Brouty (ENPC), *Macroscopic traffic flow models for pollution estimation and control*, September 2016. Supervisor: P. Goatin.

PhD in progress : Emanuele Marrone (Université de Nice Sophia Antipolis), *Conservation laws with non- local flux*, October 2016. Supervisor: P. Goatin .

PhD in progress : Nikodem Dymki (Maria Curie Skłodowska University & Université de Nice Sophia Antipolis), *Conservation laws in the modeling of collective phenomena*, October 2016. Supervisors: P. Goatin and M.D. Rosini (UMCS).

9.2.3. *Juries*

- P. Goatin was member of the committee of C. Perrin's PhD thesis "*Modèles hétérogènes en mécanique des fluides : phénomènes de congestion, écoulements granulaires et mouvement collectif*", Université de Grenoble, July 8th, 2016.
- P. Goatin was referee of R. Saint's PhD thesis "*Etude des instabilités dans les modèles de trafic*", Université Paris-Est, September 22th, 2016.
- P. Goatin was member of the committee of M. Campanella's PhD thesis "*Microscopic modelling of walking behaviour*", Delft University of Technology, November 21st, 2016.
- R. Duvigneau was member of the committee of Kevin Kasper's PhD thesis "*Apprentissage d'estimateurs sans modèle avec peu de mesures - Application à la mécanique des fluides*", ENS Cachan, October 12th, 2016.

CAGIRE Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. Member of the Organizing Committees

Member [RM] of the steering committee of the Special Interest Group “Turbulence Modelling” (SIG-15) of ERCOFTAC (European Research COmmittee for Flow, Turbulence and Combustion) that organizes a series of international workshops dedicated to cross-comparisons of the results of turbulence models and experimental/DNS databases.

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

- *Intl Symp. Turbulence, Heat and Mass Transfer* [RM]
- *Intl. Symp. Engineering Turbulence Modelling and Measurement* [RM]

10.1.2.2. Reviewer

This year, the team members have reviewed (6) contributions to the following conferences:

- ASME-GT Turbo Expo 2016 (Séoul, South Korea) (2) [PB]
- 6th Int. Symp. Hybrid RANS-LES models, 2016 (Strasbourg, France) (2) [RM]
- 36th IAHR World Congress, 2016 (The Hague, the Netherlands) (2) [RM]

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- International Journal of Aerospace Engineering: co-guest editor of the special issue "The Use of Multiperforated Liners in Gas Turbine and Aeroengine Combustion Systems" ⁰ ...[PB]
- Advisory Board of *International Journal of Heat and Fluid Flow* [RM]
- Advisory Board of *Flow, Turbulence and Combustion* [RM]

10.1.3.2. Reviewer - Reviewing Activities

During 2016, the team members reviewed (22) papers for the following journals:

- Aerospace Science and Technology (1) [PB]
- AIAA Journal (2) [RM]
- Comptes Rendus Mécanique (1) [PB]
- Computers and Fluids (3) [PB] [VP]
- Energy and Buildings (1) [PB]
- Experiments in Fluids (1) [RM]
- Flow, Turbulence and Combustion (3) [RM]
- International Journal of Heat and Fluid Flow (2) [RM]
- Journal of Aerospace Lab (1) [PB]
- Journal of Computational Physics (1) [VP]
- Journal of Fluid Mechanics (1) [RM]
- Journal of Petroleum Science and Engineering (1) [PB]
- Nuclear Engineering and Design (2) [RM]
- Parallel Computing (1) [VP]
- Physics of Fluids (1) [RM]

⁰<https://www.hindawi.com/journals/ijae/osi/>

10.1.4. Invited Talks

- Manceau, R., Progress in Hybrid Temporal LES (plenary lecture), Proc. 6th Symp. Hybrid RANS-LES Methods, Strasbourg, France, 2016

10.1.5. Research Administration

- Co-responsible for the organisation of the LMAP seminar ⁰ [JJ]
- Member of the LMAP council [PB]
- Member of the IPRA research federation council [RM]

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Master : "Maths 2: Data analysis", 39h, M1 - Génie Pétrolier, Université de Pau et des Pays de l'Adour, Pau, France. [JJ]

Licence : "Stochastic simulations", 36h, L3 - MIASHS, Université de Pau et des Pays de l'Adour, Pau, France.[JJ]

Licence : "Linear regression and invariance analysis", 19h30, L3 - MIASHS, Université de Pau et des Pays de l'Adour, Pau, France.[JJ]

Master : "Finite volumes for hyperbolic systems and compressible fluid mechanics", 24h75, M2 - MMS, Université de Pau et des Pays de l'Adour, Pau, France. [VP]

Master : "Turbulence modelling" (in English), 27h30, M2 - International Master program Turbulence, Université de Poitiers/Ecole centrale de Lille, France. [RM]

Eng. 3 : "Industrial codes for CFD" (in English), 12h30, 3rd year of engineering school (M2), ENSMA, Poitiers, France. [RM]

Eng. 3 : "Advanced physics-Turbulence modelling for CFD", 16h, 3rd year of engineering school (M2), ENSGTI, France. [RM]

10.2.2. Supervision

PhD Jean-François Wald, Adaptive wall treatment for a second moment closure in the industrial context , Université de Pau et des Pays de l'Adour, France, defended 10 May 2016, Supervisor: [RM].

PhD in progress : Nurtoleu Shakhan, Modelling and simulation of supersonic jet in crossflow, University of Al Faraby (Almaty, Kazakhstan), started October 2013 (the thesis subject has been modified mid-2014)), Supervisor: A. Naïmanova and Co-Supervisor :[PB].

Young Engineer: Benjamin Lux, Implementation of h-p multigrid in Aerosol, Supervisor: [VP]

10.2.3. Juries

The participation in the following thesis juries is noted ("referee" in a French doctoral thesis jury is more or less equivalent to an external opponent in an Anglo-Saxon like PhD jury):

- PhD: F. Laurendeau, "Analyse expérimentale et modélisation numérique d'un actionneur plasma de type jet synthétique", University of Toulouse, France, 18 October 2016. Supervisors: G. Casalis and F. Chedevergne. [RM, referee]
- PhD: G. Arroyo-Callejo « Modélisation thermique avancée d'une paroi multi-perforée de chambre de combustion aéronautique avec dilution giratoire » University of Toulouse, France, 3 May 2016. Supervisor: P. Millan. [PB, referee]

⁰<http://lma-umr5142.univ-pau.fr/live/seminaires>

- PhD: M. Nini, “Analysis of a novel hybrid RANS/LES technique based on Reynolds stress tensor reconstruction”, Politecnico di Milano, Italy, 3 March 2016. Supervisors: Antonella Abba and Massimo Germano. [RM, referee]
- PhD: L. Labarrère “Étude théorique et numérique de la combustion à volume constant appliquée à la propulsion », University of Toulouse, France, 21 March 2016. Supervisor and co-supervisor: T. Poinso et A. Dauphin. [PB]
- PhD: V. Popie « Modélisation asymptotique de la réponse acoustique de plaques perforées dans un cadre linéaire avec étude des effets visqueux », University of Toulouse, France, 14 January 2016. Supervisor and co-supervisor: S. Tordeux et E. Piot. [PB]

10.3. Popularization

- Unithé ou café, "Modelling and approximation in fluid mechanics", 21 June 2016, Inria BSO Center. [JJ]

CARDAMOM Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. Member of the Organizing Committees

H. Beaugendre: Numerical workshop for the STORM European project, Inria Bordeaux, France, November 2016

M. Colin: Congress JEF, dedicated to young researchers in PDE analysis and applications, Bordeaux, France, March 2016

M. Ricchiuto : International workshop B'WAVES 2016, Bergen, Norway, June 2016 (<https://project.inria.fr/tsunamischool2016/>)

M. Ricchiuto : TANDEM and Defis Littoral Tsunami School, Bordeaux, France, April 2016 (<http://www.uib.no/en/bwaves2016>)

M. Ricchiuto : Verification, Validation et Quantification des incertitudes en simulation numerique (VVUQ), Aristote seminar cycles, Ecole Polytechnique, France, November 2016 (http://www.association-aristote.fr/doku.php/association-aristote.fr_doku.php_simulation)

9.1.2. Scientific Events Selection

9.1.2.1. Member of the Conference Program Committees

P.M. Congedo : NICFD 2016 Conference, Varenna, Italy, October 2016.

9.1.3. Journal

9.1.3.1. Member of the Editorial Boards

Mathieu Colin is a member of the board of the journal Applications and Applied Mathematics: An International Journal (AAM)

Mario Ricchiuto is member of the editorial board of *Computers & Fluids (Elsevier)*, and of *GEM - International Journal on Geomathematics (Springer)*

A special issue of the European Journal of Mechanics / B Fluids will be dedicated to the 2 editions of the international workshop B'Waves on wave breaking, held in 2014 in Bordeaux (M. Colin and M. Ricchiuto as co-organizers), and in 2016 in Bergen (M. Ricchiuto as co-organizer). M. Colin and M. Ricchiuto will be guest editors of this issue

9.1.3.2. Reviewer - Reviewing Activities

We reviewed papers for top international journals in the main scientific themes of the team : journal of Computational Physics, Computer Methods in Applied Mechanics and Engineering, Optimization and Engineering, International Journal of Numerical Methods in Fluids, Physics of Fluids, Journal of Marine Science and Technology, Engineering Applications of Computational Fluid Mechanics, Computers and Fluids, International Journal of Modelling and Simulation in Engineering Aircraft Engineering and Aerospace Technology, International Journal of Computational Fluid Dynamics, Applications and applied mathematics : An international journal, Discrete and Continuous Dynamical Systems - Series A, Electronic Journal of Differential Equations, Calculus of Variations and Partial Differential Equations, Nonlinear Analysis: Modelling and Control, Advanced Nonlinear Studies, Communications on Pure and Applied Analysis, Communications in Computational Physics, Nonlinearity, Applications and Applied Mathematics: An International Journal, Journal of Differential Equations, Analysis and Mathematical Physics.

9.1.4. Invited Talks

- P.M. Congedo, Presentation at Journées Scientifiques Inria, June 2016, Rennes
- P.M. Congedo, “General introduction to Uncertainty Quantification”, CNES, March 2016, Toulouse
- M. Kazolea, “Wave breaking in Boussinesq free surface models”, International Workshop B’Waves2016, Bergen (Norway)
- M. Ricchiuto, “Numerical issues in tsunami simulation: dispersion and diffusion ?scales?, what order of accuracy ?”, TANDEM and Defis Littoral 2016 Tsunami school, Bordeaux

9.1.5. Leadership within the Scientific Community

P.M. Congedo has been appointed as the Co-Director of the Inria International Lab Inria-CWI.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Licence : Cécile Dobrzynski, Langages en Fortran 90, 54h, L3, ENSEIRB-MATMÉCA, FRANCE

Master : Héloïse Beaugendre, TP langage C++, 48h, M1, ENSEIRB-MATMÉCA, FRANCE

Master : Héloïse Beaugendre, Calcul Haute Performance (OpenMP-MPI), 40h, M1, ENSEIRB-MATMÉCA et Université de Bordeaux, France

Master : Héloïse Beaugendre, Initiation librairie MPI, 12h, M2, Ecole de Technologie Supérieure, Université du Québec, Montréal, Canada

Master : Héloïse Beaugendre, Responsable de filière de 3ème année, 15h, M2, ENSEIRB-MATMÉCA, France

Master : Héloïse Beaugendre, Calcul parallèle (MPI), 78h, M2, ENSEIRB-MATMÉCA, France

Master : Héloïse Beaugendre, Encadrement de projets de la filière Calcul Haute Performance, 11h, M2, ENSEIRB-MATMÉCA, France

Master : Héloïse Beaugendre, Projet fin d’études, 4h, M2, ENSEIRB-MATMÉCA, FRANCE

Master : Mathieu Colin : Intégration, M1, 54h, ENSEIRB-MATMÉCA, FRANCE

Master : Mathieu Colin : PDE, M2, 30h, ENSEIRB-MATMÉCA, FRANCE

Master : Mathieu Colin : Fortran 90, M1, 44h, ENSEIRB-MATMÉCA, FRANCE

Master : Mathieu Colin : PDE, M1, 28h, University of Bordeaux, FRANCE

Master : Mathieu Colin : Analysis, L1, 47h, ENSEIRB-MATMÉCA, FRANCE

Master: Luc Mieussens, Transport de particules : modèles, simulation, et applications, 24h, M2, ENSEIRB-MATMECA, France

Master : Luc Mieussens, Projet fin d’études, 4h, M2, ENSEIRB-MATMÉCA, FRANCE

Doctorat : P.M. Congedo, Uncertainty quantification, theory and application to algorithms, CFD and global change, Apr 2015, CERFACS, Toulouse, France, 4h.

Master : Mario Ricchiuto : Fluid Dynamics II, 20h, ENSEIRB-MATMÉCA, FRANCE

Master : Mario Ricchiuto, Encadrement de projets TER, 10h, ENSEIRB-MATMÉCA, FRANCE

9.2.2. Supervision

HdR : Héloïse Beaugendre, Contributions à la simulation numérique des écoulements fluides : exemples en milieu poreux et en aéronautique, Bordeaux University, 18 March 2016.

PhD : Fusi Francesca, Stochastic robust optimization of a helicopter rotor airfoil, March 2016.

PhD : Bellec Stevan, Discrete asymptotic modelling of free surface flows, 5 October 2016.

PhD : Viville Quentin, Construction d’une méthode hp-adaptative pour les schémas aux Résidus Distribués, Bordeaux University, 22 November 2016.

PhD: Filippini Andrea, Nonlinear finite element Boussinesq modelling of non-hydrostatic free surface flows, 14 December 2016.

PhD: Nouveau Léo, Adaptive Residual Based Schemes for Solving the Penalized Navier-Stokes Equations with Moving Bodies - Application to Ice Shedding Trajectories, Bordeaux University, 16 December 2016.

PhD in progress : Arpaia Luca, Continuous mesh deformation and coupling with uncertainty quantification for coastal inundation problems, started in March 2014.

PhD in progress : Bosi, Umberto, ALE spectral element Boussinesq modelling of wave energy converters, started in November 2015

PhD in progress : Cortesi Andrea, Predictive numerical simulation for rebuilding freestream conditions in atmospheric entry flows, started in October 2014.

PhD in progress: Lin Xi, Asymptotic modelling of incompressible reactive flows in self-healing composites, started in October 2014.

PhD in progress: Perrot Gregory, Physico-chemical modelling of self-healing ceramic composites, started in October 2011.

PhD in progress : Peluchon Simon, Approximation numérique et modélisation de l'ablation différentielle de deux matériaux: application à l'ablation liquide. Started in December 2014. Advisor: Luc Mieussens. PhD hosted in CEA-CESTA.

PhD in progress: Aurore Fallourd, Modeling and Simulation of inflight de-icing systems, Started in October 2016.

PhD in progress: Guillaume Jeanmasson, Explicit methods with local time stepping for the simulation of unsteady turbulent flows. Started in October 2016. Advisor: Luc Mieussens. Hosted in ONERA Châtillon.

PhD in progress: Francois Sanson, Uncertainty propagation in a system of codes, started in February 2016.

PhD in progress: Nassim Razaaly, Robust optimization of ORC systems, started in February 2016.

9.2.3. Juries

P.M. Congedo : Rapporteur de thèse de Elio Bufi, ENSAM Paris Tech, December 2016.

DEFI Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

- G. Allaire is scientific chair and one of the main organizers of the CEA/GAMNI seminar on computational fluid mechanics, IHP Paris (January 2016).

10.1.1.2. Member of the Organizing Committees

- L. Chesnel co-organized with Xavier Claeys and Sonia Fliss the workshop “Waves in periodic media and metamaterials” in Cargese <http://uma.ensta-paristech.fr/conf/metamath/Metamath/Workshop.html>
- L. Chesnel co-organize the seminar of the Centre de Mathématiques Appliquées of École Polytechnique.
- G. Allaire co-organized the PGMO conference (8-9 November 2016)
- J.R. Li is member of Organizing Committee of SIAM Conference on Computational Science and Engineering, 2017
- J.R. Li is organizer of Ecole d’ete d’excellence for Chinese Master’s students funded by French Embassy in China, 2017.
- H. Haddar Co-organized the “International Conference on Computational Mathematics and Inverse Problems”, Michgan, 15-19 August 2016

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

- J.R. Li is member of the SIAM Committee on Programs and Conferences 2017-2019
- H. Haddar is memeber of the scientific committee of the conference series TAMTAM and Waves

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- G. Allaire is member of the editorial board of
 - book series "Mathématiques et Applications" of SMAI and Springer,
 - ESAIM/COCV, Structural and Multidisciplinary Optimization,
 - Discrete and Continuous Dynamical Systems Series B,
 - Computational and Applied Mathematics,
 - Mathematical Models and Methods in Applied Sciences (M3AS),
 - Annali dell’Universita di Ferrara,
 - OGST (Oil and Gas Science and Technology),
 - Journal de l’Ecole Polytechnique - Mathématiques,
 - Journal of Optimization Theory and Applications.
- H. Haddar is
 - member the editorial advisory board of Inverse Problems
 - Associate Editor of the SIAM Journal on Scientific Computing

10.1.3.2. Reviewer - Reviewing Activities

The members of the team reviewed numerous papers for numerous international journals. Too many to make a list.

10.1.4. Invited Talks

- G. Allaire
 - Congrès LEM2I à Hammamet, Tunisie (avril 2016).
 - Workshop "Variational Models of Fracture" à Calgary, Canada (mai 2016).
 - Congrès ECCOMAS à Heraklion, Crête (juin 2016).
 - European forum on additive manufacturing, Chatenay Malabry (juin 2016).
- H. Haddar
 - "ATAVI International Conference on Acoustics and Vibration ICAV'2016" from 21 to 23 March 2016 in Hammamet - Tunisia
 - Journées des Mathématiciens Tunisiens à l'Etranger 20-21 juillet 2016 Cité des Sciences de Tunis
 - Oberwolfach Workshop Theory and Numerics of Inverse Scattering Problems, 18 Sep - 24 Sep 2016.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- Licence : Grégoire Allaire, Approximation Numérique et Optimisation, for students in the second year of Ecole Polytechnique curriculum: 8 lessons of 1h30.
- Licence : Houssem Haddar, Approximation Numérique et Optimisation, for students in the second year of Ecole Polytechnique curriculum: 8 TDs of 4h.
- Licence : Houssem Haddar, Variational analysis of partial differential equations, for students in the second year of Ecole Polytechnique curriculum: 8 TDs of 4h.
- Licence: Lucas Chesnel, "Elementary tools of analysis for partial differential equations", 29 equivalent TD hours, L3, Ensta ParisTech, Palaiseau, France
- Master : Grégoire Allaire, Optimal design of structures, for students in the third year of Ecole Polytechnique curriculum. 9 lessons of 1h30.
- Master : Grégoire Allaire, Transport et Diffusion, for students in the third year of Ecole Polytechnique curriculum. With F. Golse, 1/2 of 9 lessons of 1h30.
- Master : Houssem Haddar, Inverse problems, for Master (M2) students of Ecole Polytechnique and Paris 6 University, 1/2 of 9 lessons of 2h.
- Master: Lucas Chesnel, "The finite element method", 6 equivalent TD hours, M1, Ensta ParisTech, Palaiseau, France

10.2.2. Supervision

- Ph.D. : G. Fournet, Inclusion of blood flow in micro-vessels in a new dMRI signal model, October 2016, J.-R. Li and L. Ciobanu
- Ph.D.: S. Schiavi, Homogenized models for Diffusion MRI, December 2016, H. Haddar and J.-R. Li
- PhD : M. Giacomini, Shape optimization and Applications to aeronautics, December 2016, O. Pantz and K. Trabelsi
- PhD : A. Maury, shape optimization for non-linear structures, December 2016, G. Allaire and F. Jouve
- PhD : C. Patricot, coupling algorithms in neutronic/thermal-hydraulic/mechanics for numerical simulation of nuclear reactors, March 2016, G. Allaire and E. Hourcade

- PhD in progress : J.-L. Vié, optimization algorithms for topology design of structures, December 2016, G. Allaire and E. Cancès
- Ph.D. in progress: M. Lakhal, Time domain inverse scattering for buried objects, 2014, H. Haddar
- Ph.D. in progress: T.P. Nguyen, Direct and Inverse scattering from locally perturbed layers, 2013, H. Haddar
- Ph.D. in progress: B. Charfi, Identification of the singular support of a GIBC, 2014, H. Haddar and S. Chaabane
- Ph.D. in progress: K. Van Nguyen, Modeling, simulation and experimental verification of water diffusion in neuronal network of the Aplysia ganglia, 2014, J.-R. Li and L. Ciobanu
- PhD in progress : A. Talpaert, the direct numerical simulation of vapor bubbles at low Mach number with adaptative mesh refinement, 2013, G. Allaire and S. Dellacherie
- PhD in progress : A. Bissuel, linearized Navier Stokes equations for optimization, floating and aeroacoustic, 2014, G. Allaire
- PhD in progress :P. Geoffroy on topology optimization by the homogenization method in the context of additive manufacturing (Safran Tech, to be defended in 2019), G. Allaire.
- PhD in progress : K. Nepal, Transmission eigenvalues and non destructive testing of concrete like materials , 2016, L. Chesnel H. Haddar and L. Audibert
- PhD in progress : M. Kchaou, Higher order homogenization tensors for DMRI modeling, 2016, H. Haddar, J.R Li and M. Moakher

ECUADOR Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific events organisation

9.1.1.1. Member of the organizing committees

- Laurent Hascoët is on the organizing committee of the EuroAD Workshops on Algorithmic Differentiation.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Master : Laurent Hascoët, Optimisation avancée, 15 h, M2, University of Nice

9.2.2. Supervision

PhD in progress : Ala Taftaf, “Extensions of Algorithmic Differentiation by Source Transformation to meet some needs of Scientific Computing”, started july 2013, advisor L. Hascoët.

PhD in progress : Éléonore Gauci, “Norm-oriented criteria for CFD and coupled CSM-CFD systems”, started october 2014, advisor A. Dervieux

9.2.3. Juries

- Alain Dervieux, jury, PhD defense of Laure Billon, Mines Paristech, december 9.
- Laurent Hascoët, jury, PhD defense of Vladimir Groza, University of Nice, november 9.

9.3. Popularization

Laurent Hascoët wrote an article about AD for the blog “binaire”, hosted by “Le Monde”. May 9.

GAMMA3 Project-Team

7. Dissemination

7.1. Promoting Scientific Activities

7.1.1. Scientific Events Organisation

7.1.1.1. Member of the Organizing Committees

A. Loseille is a committee member of the International Meshing Roundtable.

7.1.2. Scientific Events Selection

7.1.2.1. Member of the Conference Program Committees

P. Laug has been a Member of the Conference Committee of The 13th ISGG Symposium on Numerical Grid Generation, hosted at The 20th IMACS World Congress, Xiamen, China, 10-14 Dec. 2016.

7.1.2.2. Reviewer

Team members have reviewed papers for the International Meshing Roundtable and MASCOT/ISGG.

7.1.3. Journal

7.1.3.1. Reviewer - Reviewing Activities

Team members have reviewed manuscripts submitted to International Journal for Numerical Methods in Engineering, Journal of Computational Physics, Computers and Structures, Engineering with Computers, MATCOM, SIAM Journal.

7.1.4. Scientific Expertise

P. Laug has been a Member of a Site Visit Committee for an Industrial Research Chair application at the NSERC/CRSNG (Natural Sciences and Engineering Research Council of Canada / Conseil de recherches en sciences naturelles et en génie du Canada), Université Laval, Quebec City, Nov. 2016.

7.2. Teaching - Supervision - Juries

HdR : Laurence Moreau, Méthodes de remaillage et d'optimisation pour la simulation numérique, mémoire d'Habilitation à diriger des Recherches, Université de Technologie de Troyes, 26 Mai 2015.

7.2.1. Juries

- F. Alauzet a été Président du jury d'HDR de G. Puigt (Université de Toulouse)
- P. L. George a été rapporteur du jury de thèse de G. Brèthes (Inria Sophia)
- A. Loseille a été examinateur pour la thèse d'A. Botella (Université de Lorraine)

IPSO Project-Team

6. Dissemination

6.1. Promoting Scientific Activities

6.1.1. Scientific Events Organisation

6.1.1.1. Member of the Organizing Committees

- François Castella and Philippe Chartier organized the workshop "Multiscale methods for Schrödinger and kinetic equations", Saint-Malo (France), december 12-14, 2016.
- Arnaud Debussche organized the conference "Stochastic Partial Differential Equations and Applications-X, Levico Terme (Italy), may 30-june 4, 2016.
- Erwan Faou organized the workshop "Geometric Numerical Integration", Oberwolfach (Germany), march 20-26, 2016. Co-organized with E. Hairer, M. Hochbruck and C. Lubich.

6.1.2. Journal

6.1.2.1. Member of the Editorial Boards

- Philippe Chartier is member of the editorial board of "Mathematical Modelling and Numerical Analysis" (2007-).
- Arnaud Debussche is editor in chief of the journal "Stochastics and Partial Differential Equations: analysis and computations".
- Arnaud Debussche is member of the editorial board of Potential Analysis (2011-).
- Arnaud Debussche is member of the editorial board of Differential and Integral Equations (2002-).
- Arnaud Debussche is member of the editorial board of ESAIM:PROC (2012-).
- Arnaud Debussche is member of the editorial board of Journal of Evolution Equation (2014-).
- Arnaud Debussche is member of the editorial board of Applied Mathematics & Optimization (2014-).
- Arnaud Debussche is member of the editorial board of the collection : "Mathématiques & Applications" (Springer).
- Erwan Faou was editor of the Oberwolfach reports [31] (2016).

6.1.2.2. Reviewer - Reviewing Activities

Members of IPSO are reviewers for almost the journals in which they publish.

6.1.3. Invited Talks

- Philippe Chartier was invited speaker at the workshop "Mould calculus, from multiple zeta values to B-series", Pau (France), december 1-2, 2016.
- Philippe Chartier was plenary speaker at the international conference ICNAAM, Rhodes (Greece), september 2016.
- Philippe Chartier was invited speaker at the workshop "GAMPP", IPP Garching (Germany), september 12-16, 2016.
- Philippe Chartier was invited speaker at the workshop "Stability and discretization issues in differential equations", Trieste (Italy), june 2016.
- Philippe Chartier gave a seminar at the university of Lille (France), june 9, 2016.
- Philippe Chartier was invited speaker at Meeting ANR Moonrise, Toulouse (France), june 2-3, 2016.

- Philippe Chartier gave a seminar at the university of Geneva (Switzerland), may 26-june 1, 2016.
- Philippe Chartier was invited at the workshop "Geometric Numerical Integration", Oberwolfach (Germany), march 20-26, 2016.
- Nicolas Crouseilles was invited at the workshop "Geometric Numerical Integration", Oberwolfach (Germany), march 20-26, 2016.
- Nicolas Crouseilles gave a seminar at the university of Geneva (Switzerland), may 13, 2016.
- Nicolas Crouseilles gave a seminar at the university of Paris Sud, Orsay (France), november 17, 2016.
- Nicolas Crouseilles was invited speaker at the workshop "NumKin", Strasbourg (France), october 17-21, 2016.
- Nicolas Crouseilles was invited speaker at the workshop "Kinet", Madison (US), april 21-25, 2016.
- Arnaud Debussche was invited speaker at the workshop "Probabilistic models-from discrete to continuous", university of Warwick (UK), march 29-april 2, 2016.
- Arnaud Debussche was invited speaker at the workshop "Stochastic Analysis and Related Fields", Humboldt university Berlin (Germany), july 28-30, 2016.
- Arnaud Debussche was invited speaker at the workshop "Nonlinear Wave and Dispersive Equations", Kyoto university (Japan), september 6-8, 2016.
- Arnaud Debussche was invited speaker at the workshop "Nonlinear Stochastic Evolution Equations: Analysis and Numerics", TU Berlin (Germany), november 3-5, 2016.
- Erwan Faou gave a seminar at the CERMICS, Marne-La-Vallée (France), december 2016.
- Erwan Faou was invited at the workshop "Structure and scaling in computational field theories", Oslo (Norway), november 2016.
- Erwan Faou was invited at the conference "Nonlinear waves", IHES (France), may 2016.
- Erwan Faou was invited at the workshop "Nonlinear Evolution Problems", Oberwolfach (Germany), march 2016.
- Erwan Faou was invited at the workshop "Recent trends in nonlinear evolution equations", CIRM-Luminy (France), april 4-8, 2016.
- Mohammed Lemou was plenary speaker at the workshop "Asymptotic behavior of systems of PDE arising in physics and biology: theoretical and numerical points of view", Lille (France), june 2016.
- Mohammed Lemou was invited speaker at the workshop "NumKin", Strasbourg (France), october 17-21, 2016.
- Mohammed Lemou was invited speaker at the workshop "Kinet", Madison (US), april 21-25, 2016.
- Mohammed Lemou was invited speaker at the ANR Moonrise Meeting, Toulouse (France), june 2016.
- Florian Méhats was plenary speaker at the workshop "Journée des jeunes EDPistes français", Bordeaux (France).
- Florian Méhats gave a seminar of the university of Paris Sud, Orsay (France).
- Florian Méhats gave a seminar of the university of Nice (France).
- Florian Méhats gave a seminar of the university of Lille (France).

6.1.4. Scientific Expertise

- Philippe Chartier was member of the hiring committee of an associate professor, university of Trondheim (Norway).
- Philippe Chartier was member of the hiring committee CR2-Inria (Bordeaux).
- Nicolas Crouseilles was member of the CORDI-S committee at Inria-Rennes.
- Arnaud Debussche was a member of the hiring committee of a professor, university of Rennes 1

- Arnaud Debussche was a member of the hiring committee of a "Maître de conférence", university of Orléans.
- Mohammed Lemou was member of the hiring committee of a professor, university of Rennes 1.
- Mohammed Lemou was was a member of the hiring committee of a "Maître de conférence", university of Nantes.

6.1.5. Research Administration

- François Castella is member of the IRMAR laboratory council.
- Philippe Chartier is the vice-head of science (DSA) of the Rennes Inria-Center.
- Philippe Chartier is member of the direction committee (ED) of the Rennes Inria-Center.
- Philippe Chartier is member of the national evaluation committee (CE) of Inria.
- Nicolas Crouseilles is member of the Scientific Council of the ENS Rennes.
- Nicolas Crouseilles is member of the committee of the Fédération de Fusion".
- Arnaud Debussche is vice president in charge of research and international relations of the Ecole Normale Supérieure de Rennes.
- Arnaud Debussche is member of the executive board of the Lebesgue Center.
- Arnaud Debussche is director of the "Agence Lebesgue de Mathématiques pour l'Innovation".
- Erwan Faou was member of the COST-GTRI (Comité d'orientation scientifique et technologique, groupe de travail pour les relations internationales) at Inria.
- Erwan Faou is member of the Scientific Council of the Pôle Universitaire Léonard de Vinci.
- Erwan Faou is member of the CNU 26.
- Mohammed Lemou is member of the Scientific Council of the ENS Rennes.
- Mohammed Lemou is member of the Scientific Council of the Lebesgue Center.
- Mohammed Lemou is head of the team "analyse numérique" of IRMAR laboratory.
- Florian Méhats is head of the IRMAR laboratory.

6.2. Teaching - Supervision - Juries

6.2.1. Teaching

- François Castella gave a course in M1 on kinetic equations, university of Rennes 1 (60 hours).
- Philippe Chartier gave a course in L3 on ordinary differential equations, Ecole Normale Supérieure de Rennes (24 hours).
- Philippe Chartier gave a course in M2 on geometric numerical integration and averaging methods, university of Rennes 1 (24 hours).
- Nicolas Crouseilles gave a course in M2 on numerical methods for kinetic equations, university of Rennes 1 (12 hours).
- Arnaud Debussche gave a course in M2 on stochastic partial differential equations, university of Rennes 1 (24 hours).
- Erwan Faou gave a course in M1 on modelisation and numerical analysis of PDEs, ENS Paris, in collaboration with E. Dormy.
- Mohammed Lemou gave a course in M2 on partial differential equations, university of Rennes 1 (24 hours).
- Mohammed Lemou is head of the M2 "Analyse et Applications".

6.2.2. Supervision

- François Castella supervises the PhD thesis of Valentin Doli, *Mathematical and ecological study of the propagation of a specific virus attacking plants*, (2014-). Co-advisor: Frédéric Hamelin (Agro-Rennes).
- François Castella and Philippe Chartier supervised the PhD thesis of Julie Sauzeau, *Highly-oscillatory central manifold and application to ecology* (2013-2016). Julie Sauzeau is now teacher.
- Nicolas Crouseilles and Erwan Faou supervise the PhD thesis of Joackim Bernier, *Mathematical and numerical analysis of nonlinear transport equations*, (2016-).
- Nicolas Crouseilles and Mohammed Lemou supervised the PhD thesis of H el ene Hivert *Mathematical and numerical study of kinetic model and their asymptotics: diffusion and anomalous diffusion limit*, (2013-2016). H el ene Hivert is now post-doc at ENS Lyon.
- Erwan Faou supervises the PhD thesis of Romain Horsin, *Mathematical and numerical analysis of the Vlasov-HMF model*, (2014-). Co-advisor: Fr ed eric Rousset (university Paris Sud Orsay).
- Arnaud Debussche supervises the PhD thesis of Mac Jugal Nankep *PDMP with spatial dependency for the dynamics of gene networks*, (2014-).
- Arnaud Debussche and Florian M ehats are supervisors of the PhD thesis of Maxime Tusseau. *Highly oscillatory nonlinear Schr odinger equation with stochastic potential*, (2013-).
- Mohammed Lemou and Florian M ehats are supervisors of the PhD thesis of Marine Malo *Collision-less kinetic equations: stability, oscillations*, (2015-).

6.2.3. Juries

- Erwan Faou was referee of the PhD thesis of Ahmed-Amine Homman (CEA and ENPC), june 2016.
- Nicolas Crouseilles was referee of the PhD thesis of Mehdi Badsı (university Paris 6), october 2016.
- Nicolas Crouseilles was referee of the PhD thesis of Nhung Pham (university of Strasbourg), december 2016.
- Nicolas Crouseilles was member of the jury of the PhD thesis of Julie Sauzeau (university of Rennes 1), june 2016.
- Arnaud Debussche was referee of the PhD thesis of Nathalie Ayi (university of Nice), june 2016.
- Arnaud Debussche was member of jury of the PhD thesis of Vincent Renault (university of Paris 6), september 2016.
- Mohammed Lemou was referee of the PhD thesis of Thomas Le Roy (university Paris 6), january 2016.
- Mohammed Lemou was referee of the PhD thesis of Ankit Ruhi (IIS, Bangalore, India), december 2016.
- Mohammed Lemou was member of the jury of the PhD thesis of S ebastien Guisset (university of Bordeaux 1), september 2016.

MATERIALS Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

E. Cancès

- is a member of the editorial boards of *Mathematical Modelling and Numerical Analysis* (2006-), *SIAM Journal of Scientific Computing* (2008-), *Communications in Mathematical Sciences* (2011-), and *SIAM MMS* (2012-),
- is a member of the executive committee of the CEA-EDF-Inria schools in applied mathematics and computer science.

He has organized or co-organized:

- a CECAM workshop on the mathematical and numerical analysis of electronic structure models, Roscoff, Jul. 8-12, 2016,
- the MMM 2016 conference (Multiscale Modelling of Materials), Dijon, Oct. 10-14, 2016,
- an IPAM workshop on collective variables in quantum mechanics, Los Angeles, Nov. 14-18, 2016.

L. Chamoin has organized the mini-symposium "Verification of reduced models in computational mechanics" within the ECCOMAS 2016 conference, Greece, June 2016.

V. Ehrlacher has co-organized with A. Cousin the semester on "Uncertainty Quantification" in the framework of the IHP thematic semester on "Monte-Carlo methods" organized by B. Bouchard, E. Gobet and B. Jourdain.

C. Le Bris is editor-in-chief of *Applied Mathematics Research Express* (2003-). He is a managing editor of *Networks and Heterogeneous Media*. He is a member of the editorial boards of *Annales mathématiques du Québec* (2013-), *Archive for Rational Mechanics and Analysis* (2004-), *COCV (Control, Optimization and Calculus of Variations)* (2003-), *Mathematics in Action* (2008-), *Nonlinearity* (2005-) and *Journal de Mathématiques Pures et Appliquées* (2009-).

He is a member of the editorial boards of the monograph series *Mathématiques & Applications, Series*, Springer (2008-), *Modelling, Simulations and Applications, Series*, Springer (2009-), *Springer Monographs in Mathematics*, Springer (2016-).

He is a member of

- the Cabinet of the High Commissioner for Atomic Energy,
- the "Comité d'experts" for the Fondation de Recherche pour l'Aéronautique et l'Espace,
- the "International Scientific Advisory Committee" of the Centre de Recherche Mathématique, Université de Montréal,
- the "Advisory Board" of the DFG Cluster of Excellence Engineering of Advanced Materials, Erlangen,
- the "International Scientific Advisory Board" of the DFG research center Matheon, Berlin,
- the "Conseil scientifique de la SMAI" (Scientific Council of the French Applied Maths Society),
- the International Mathematical Union Circle.

He has held a regular position of Visiting Professor at the University of Chicago.

F. Legoll

- is a member of the editorial board of *SIAM MMS* (2012-) and of *ESAIM Proc* (2012-),
- has co-organized the mini-symposium "Mathematical theory and computational techniques for multiscale materials modelling" within the MMM 2016 conference, Dijon, October 10-14, 2016 (with W. Curtin, C. Garcia-Cervera, J. Kermode, X. Li, A. Lozinski, M. Luskin and C. Ortner).

T. Lelièvre

- is editor-in-chief of ESAIM: Proceedings (with D. Chafai, P. Lafitte and C. Mouhot),
- is a member of the "Conseil d'Administration" of SMAI and Ecole des Ponts,
- has been a member of the ANR committee CES-40 "mathématiques et informatique",
- has co-organized the Journées EDP-Probab at Institut Henri Poincaré (with F. Malrieu),
- has co-organized the workshop "COMputational Statistics and MOlecular Simulation" in Paris, February 2-5th, 2016 (with A. Guyader and G. Stoltz),
- has co-organized the IHP conference on "Recent developments in numerical methods for model reduction", November 7-10th 2016. (with S. Perotto and G. Rozza),
- will co-organize the IPAM Long Program on "Complex High-Dimensional Energy Landscapes", September 11th - December 15th 2017 (with C. Clementi, G. Henkelman, R. Hennig, M. Luskin, N. Marom, P. Plechac and C. Schuette),
- will co-organize the ICTS program on "Large deviation theory in statistical physics: Recent advances and future challenges", August 14th - October 13th 2017 (with A. Ayyer, F. den Hollander, A. Dhar, J.P. Garrahan, C. Jarzynski, M. Krishnapur, S. Sabhapandit and H. Touchette).

G. Stoltz

- is a member of the scientific council of UNIT (Université Numérique Ingénierie et Technologie),
- will co-organize the IHP trimester "Stochastic Dynamics Out of Equilibrium", Spring 2017 (with G. Giacomini, S. Olla, E. Saada and H. Spohn).

9.2. Teaching - Supervision - Juries

The members of the project-team have taught the following courses:

- Licence: Outils mathématiques pour l'ingénieur, 15h, L3, École des Ponts (E. Cancès, V. Ehrlicher, M. Josien, F. Legoll, T. Lelièvre),
- Licence: Équations aux dérivées partielles et éléments finis, 15h, L3, École des Ponts (T. Hudson, F. Legoll, A. Levitt),
- Licence: Hydrodynamique numérique, 15h, L3, École des Ponts (S. Boyaval),
- Licence: Maths 1 et 2, 9h, L3, École des Mines (G. Stoltz),
- Licence: Mathématiques pour l'économie, 36h, L1, Dauphine (J. Roussel),
- Licence: Analyse et calcul scientifique, 30h, L3, Ecole des Ponts (T. Hudson, M. Josien, B. Nectoux, G. Stoltz),
- Master: Mécanique des milieux continus - partie solides, 14h, M1, ENS Cachan (L. Chamoin),
- Master: Ondes et chocs dans les structures, 8h, M1, ENS Cachan (L. Chamoin),
- Master: Mathématiques des modèles multiéchelles, 39h, M1, École des Ponts (F. Legoll),
- Master: Analyse et équations aux dérivées partielles, 36 h, M1, École des Ponts (T. Lelièvre),
- Master: Projet de département IMI, 12h, M1, École des Ponts (J. Roussel),
- Master: Projets de physique, 10h, M1, École des Ponts, France (A. Levitt, G. Stoltz),
- Master: Modélisation mathématique des vagues, 3h, École des Ponts (S. Boyaval),
- Master: Analyse de Fourier et applications, 16h, M1, École des Ponts (V. Ehrlicher, A. Levitt, G. Stoltz),
- Master: Approximation numérique et optimisation, 32h, École Polytechnique (E. Cancès, T. Lelièvre),
- Master: Analyse variationnelle des équations aux dérivées partielles, 32h, École Polytechnique (E. Cancès),

- Master: Contrôle des modèles et dualité, 24h, M2 Mathématiques et Applications, ENS Cachan (L. Chamoin),
- Master: Problèmes multi-échelles, 24h, M2 Mathématiques et Applications, Paris 6 (F. Legoll),
- Master: Méthodes variationnelles et théorie spectrale, 10h, M2 Mathématiques et Applications, Paris 6 (E. Cancès),
- Master: Méthodes numériques probabilistes, 24 h, M2 Mathématiques et Applications, Paris 6 (T. Lelièvre),
- Master: Introduction to computational statistical physics, 20h, M2 Mathématiques et Applications, Paris 6 (G. Stoltz).

The following PhD theses have been defended in the group at École des Ponts:

- Eddy Bernard, Université Paris-Est, defended on Nov. 25, 2016, supervised by G. Chabaud (Université Paris-Est) and E. Cancès,
- Jean-Léopold Vié, Université Paris-Est, École des Ponts and Ecole Polytechnique, defended on Dec. 16, 2016, supervised by G. Allaire (Polytechnique) and E. Cancès,
- Ahmed-Amine Homman, Multiscale methods for the simulation of shock and detonation waves, Université Paris-Est, École des Ponts and CEA/DAM, defended on June 16, 2016, supervised by G. Stoltz and J.-B. Maillet (CEA),
- François Madiot, Multiscale finite element methods for advection diffusion problems, Université Paris-Est, Ecole des Ponts ParisTech, defended on December 8, 2016, supervised by C. Le Bris and F. Legoll,
- Rémi Saint, Study of instabilities in traffic models, defended on September 22, 2016, supervised by T. Lelièvre and X. Louis (IFSTTAR),

The following PhD theses are ongoing in the group at École des Ponts:

- Athmane Bakhta, Modélisation and simulation for photovoltaic applications, Université Paris-Est, École des Ponts, started October 1st, 2014, supervised by E. Cancès and T. Lelièvre, co-supervised by V. Ehrlacher,
- Amina Benaceur, Thèse CIFRE EDF, started January 1st, 2016, supervised by A. Ern, co-supervised by V. Ehrlacher, in collaboration with G. Blatman (EDF) and S. Meunier (EDF),
- Lingling Cao, Mathematical analysis of models of thermo-electronic transport, Université Paris-Est, École des Ponts, started November 1st, 2016, supervised by E. Cancès and G. Stoltz,
- Qiming Du, Mathematical analysis of splitting methods, École Doctorale Sciences Mathématiques de Paris Centre, started September 1st, 2016, supervised by A. Guyader (UPMC) and T. Lelièvre,
- Jérôme Faure, Multiscale methods for the simulation of shock and detonation waves, Université Paris-Est, École des Ponts and CEA/DAM, started November 1st 2014, supervised by G. Stoltz and J.-B. Maillet (CEA),
- Grégoire Ferré, Efficient sampling methods for nonequilibrium systems, Université Paris-Est, École des Ponts, started October 1st, 2016, supervised by G. Stoltz,
- Marc Josien, Multiscale approaches for materials science, started September 1st, 2015, supervised by C. Le Bris,
- Henri Louvin, Splitting methods and radioprotection, Ecole Doctorale PHENIICS, started September 1st, 2014, supervised by Check Diop (CEA) and T. Lelièvre,
- Boris Nectoux, Metastability and quasi stationary distribution, started November 1st, 2014, supervised by T. Lelièvre and E. Cancès,
- Julien Roussel, Variance reduction techniques for nonequilibrium systems, Université Paris-Est, École des Ponts, started September 1st, 2015, supervised by G. Stoltz,
- Pierre-Loik Rothé, Numerical methods for the estimation of fluctuations in multi-scale materials and related problems, started October 1st, 2016, supervised by F. Legoll,
- Laura Silva Lopes, Rare event simulation and applications to biological systems, started October 1st, 2016, supervised by J. Hénin (IBPC) and T. Lelièvre,
- Pierre Terrier, Reduced models for defect migration in metals, Université Paris-Est, École des Ponts and CEA Saclay, started September 1st, 2015, supervised by G. Stoltz and M. Athènes (CEA),

Project-team members have participated in the following PhD juries:

- S. Boyaval was in the jury for the PhD of Viljami Laurmaa (“An octree-based adaptive semi-Lagrangian free surface flow solver”), defended at EPFL in May 2016.
- S. Boyaval was in the jury for the PhD of Joubine Aghili (“Méthodes de discrétisation et de réduction de modèle pour des EDP à coefficients variables”), defended in Montpellier in December 2016.
- E. Cancès was a referee of the PhD of Maxime Morinière (“États résonants en théorie de perturbation à plusieurs corps”), defended in Grenoble in December 2016.
- V. Ehrlacher was in the jury for the PhD of Luca Nenna (“Numerical methods for Multi-Marginal Optimal Transport”), defended at Paris Dauphine in December 2016.
- V. Ehrlacher was in the jury for the PhD of Jean-Léopold Vié (“Second-order derivatives for shape optimization with a level-set method”), defended at CERMICS in December 2016.
- V. Ehrlacher was in the jury for the PhD of Faizan Nazar (“Electronic Structure of Defects in the Thomas-Fermi-von Weiszäcker Model”), defended at Warwick in December 2016.
- F. Legoll was in the jury for the PhD of Dena Kazerani (“Études mathématiques de fluides à frontières libres en dynamique incompressible”), defended at UPMC in November 2016.
- T. Lelièvre was a referee for the PhD of Tomasz Badowski on “Adaptive importance sampling via minimization of estimators of cross-entropy, mean square and inefficiency constants” defended at Freie Universität Berlin.
- T. Lelièvre was a referee for the PhD of Arthur Talpaert on “Direct Numerical Simulation of bubbles with Adaptive Mesh Refinement with distributed algorithms” defended at École Polytechnique.
- T. Lelièvre was in the jury for the PhD of Ahmed-Amine Homman (“Développement de schémas numériques d’intégration de méthodes multi-échelles”), defended at CERMICS in June 2016.
- T. Lelièvre was in the jury for the PhD of Gang Liu on “Rare event simulation by shaking transformation and Non-intrusive stratified resampling method for dynamic programming”, defended at École Polytechnique in November 2016.

Project-team members have participated in the following habilitation juries:

- E. Cancès was a referee of Stéphane Redon’s HdR, defended in Grenoble in May 2016.
- E. Cancès participated in the HdR jury of Nicolas Rougerie, defended in Grenoble in November 2016.
- T. Lelièvre was a referee of Pierre Etoré’s HDR (“Quelques contributions à l’étude et à la simulation des diffusions asymétriques”), defended in Grenoble in December 2016.

9.3. Conference participation

Members of the project-team have delivered lectures in the following seminars, workshops and international conferences:

- S. Boyaval, Atelier Sillage et ondes de surface, Orsay, April 2016,
- S. Boyaval, Séminaire Modélisation mathématique et calcul scientifique, ENS Lyon and Institut Camille Jordan, May 2016,
- S. Boyaval, Workshop on Stochastic Partial Differential Equations, Pau, June 2016,
- S. Boyaval, Symposium on shallow-water flows at HYP 2016, Aachen, August 2016,
- S. Boyaval, Symposium on network models in PDEs at SIMAI 2016, Milan, September 2016,
- E. Cancès, seminar, Groupe de travail numérique, Laboratoire Jacques-Louis Lions, UPMC, January 2016,
- E. Cancès, workshop on computation of quantum systems in cold-matter physics and chemistry, Fields Institute, Toronto, February 2016,

- E. Cancès, Colloquium, University of Delaware, May 2016,
- E. Cancès, SIAM MS conference (invited lecture), May 2016,
- E. Cancès, KiNet workshop on mathematical and computational methods in quantum chemistry, Yale, New Haven, May 2016,
- E. Cancès, Solid Math workshop, Aalborg, May 2016,
- E. Cancès, KiNet workshop on quantum and kinetic transport, Jiatong University, Shanghai, June 2016,
- E. Cancès, workshop on coupled mathematical models for physical and nanoscale systems and their applications, Banff, Canada, August 2016,
- E. Cancès, Multiscale Modelling of Materials (MMM 2016) conference (invited lecture), Dijon, October 2016,
- L. Chamoin, Séminaire de l'équipe MISES, UPMC, Paris, April 2016,
- L. Chamoin, SIAM Conference on Uncertainty Quantification, Lausanne, April 2016,
- L. Chamoin, Workshop "New Challenges in Computational Mechanics", Cachan, May 2016,
- L. Chamoin, ECCOMAS conference, Hersonissos, Greece, June 2016,
- G. Di Gesù, IST Austria, Vienne, June 2016,
- G. Di Gesù, Eurandom YEP Workshop on Large Deviations for Interacting Particle Systems and Partial Differential Equations, Eindhoven, March 2016,
- V. Ehrlacher, Workshop on "Challenges in High-Dimensional Analysis and Computation", San Servolo, Italy, May 2016,
- V. Ehrlacher, Séminaire du CEREMADE, Université Paris-Dauphine, September 2016,
- V. Ehrlacher, Institute for Computational and Applied Mathematics seminar, University of Münster, Germany, October 2016,
- V. Ehrlacher, MATHCCES seminar, RWTH Aachen University, Germany, October 2016,
- V. Ehrlacher, EMI 2016 conference, Metz, France, October 2016,
- V. Ehrlacher, MMM 2016 conference, Dijon, France, October 2016,
- V. Ehrlacher, Workshop on "Recent developments in numerical methods for model reduction", Institut Henri Poincaré, France, November 2016,
- V. Ehrlacher, Séminaire "Problèmes spectraux en physique mathématique", December 2016,
- G. Ferré, seminar of the IPAM program 'Understanding Many Particle Systems with Machine Learning, Los Angeles, November 2016,
- G. Ferré, workshop 'Collective Variables in Quantum Mechanics', Los Angeles, November 2016,
- T. Hudson, 7th European Congress of Mathematics, Berlin, July 2016,
- T. Hudson, Applied Math Seminar, UNC Charlotte, May 2016,
- M. Josien, CANUM 2016, Obernai, France, May 2016,
- M. Josien, MMM 2016 conference, Dijon, France, October 2016,
- C. Le Bris, Edinburgh Mathematical Society Lecturer, Dundee, UK, March 18, 2016,
- C. Le Bris, Sissa workshop on Homogenization, SISSA, Trieste, June 6-10, 2016,
- C. Le Bris, PDE Seminar of the University of Chicago, February and November 2016,
- C. Le Bris, Seminar at the Applied Mathematics Department of the University of Washington at Seattle, October 2016,
- F. Legoll, EMI-PMC 2016 conference, Nashville, USA, May 2016,
- F. Legoll, ECCOMAS conference, Hersonissos, Greece, June 2016,
- F. Legoll, Weekly seminar of the LMS laboratory, Ecole Polytechnique, June 2016,

- F. Legoll, AIMS conference, Orlando, USA, July 2016,
- F. Legoll, WCCM conference, Seoul, South Korea, July 2016,
- F. Legoll, ECCM conference, Brussels, Belgium, Sept. 2016,
- F. Legoll, MMM 2016 conference, Dijon, France, October 2016,
- F. Legoll, Workshop on "Recent developments in numerical methods for model reduction", Paris, France, November 2016,
- F. Legoll, CASA weekly seminar, Eindhoven, the Netherlands, November 2016,
- F. Legoll, IFPEEn weekly seminar, Paris, France, December 2016,
- T. Lelièvre, Plenary speaker at MCMSKI 2016, Lenzerheide, January 2016,
- T. Lelièvre, Séminaire Laboratoire Jacques-Louis Lions, February 2016,
- T. Lelièvre, Séminaire "Incertitudes" à EDF, March 2016,
- T. Lelièvre, Séminaire Institut de Biologie Physico-Chimique, March 2016,
- T. Lelièvre, Workshop "Particle methods for the management of risks", Paris, April 2016,
- T. Lelièvre, Séminaire équipe Inria ABS, April 2016,
- T. Lelièvre, SIAM Uncertainty Quantification, Lausanne, April 2016,
- T. Lelièvre, Workshop "Challenges in High-Dimensional Analysis and Computation", San Servolo, May 2016,
- T. Lelièvre, CANUM, May 2016,
- T. Lelièvre, Séminaire du laboratoire MICS, Centrale Supélec, June 2016,
- T. Lelièvre, Warwick Mathematics Colloquium, June 2016,
- T. Lelièvre, Workshop "Extreme events in the Earth and planetary sciences", Warwick, July 2016,
- T. Lelièvre, Faraday discussion "Reaction rate theory", Cambridge, September 2016,
- T. Lelièvre, Workshop MMM2016, October 2016,
- A. Levitt, Workshop on computation of quantum systems in cold-matter physics and chemistry, Toronto, Canada, February 2016,
- A. Levitt, Parallel Processing '16, Paris, April 2016,
- A. Levitt, Remise de prix Bull-Fourier 2015, Paris, April 2016,
- A. Levitt, GDR REST (rencontres de spectroscopie théorique) meeting, Roscoff, May 2016,
- A. Levitt, PASC 2016, Lausanne, May 2016,
- A. Levitt, 2016 ECMI Congress, Santiago de Compostela, May 2016,
- A. Levitt, Mathematical and numerical analysis of electronic structure models, Roscoff, July 2016,
- A. Levitt, Mathematics seminar, Aachen, March 2016,
- A. Levitt, Mathematical physics seminar, Texas A&M, November 2016,
- A. Levitt, Séminaire de mathématiques appliquées, Collège de France, December 2016,
- F. Madiot, CANUM 2016, Obernai, France, May 2016,
- P. Monmarché, Inria junior seminar, September 2016,
- B. Nectoux, groupe de travail "chimie quantique", Université Pierre et Marie Curie, January 2016,
- G. Stoltz, IPAM workshop "Collective Variables in Classical Mechanics", Los Angeles, October 2016,
- G. Stoltz, The 8th Multiscale Materials Modelling international conference, Dijon, November 2016,
- G. Stoltz, SIAM Conference on Mathematical Aspects of Materials Science 2016, Philadelphie, May 2016,
- P. Terrier, The 8th Multiscale Materials Modelling international conference, Dijon, November 2016.

Members of the project-team have delivered the following series of lectures:

- E. Cancès, Optical and electronic excitations in molecules and solids, 3h, Physics department, Harvard University, April 2016,
- E. Cancès, First-principle molecular simulation, 4h, French-Spanish Jacques-Louis Lions Summer School, Gijon, June 2016,
- E. Cancès, Density Functional Theory: models and numerical methods, 4h, KiNet summer school, Santa Barbara, June 2016,
- E. Cancès, Mathematical representations of quantum states, 2h, IPAM tutorial, Los Angeles, September 2016,
- E. Cancès, Mathematical techniques for quantum chemistry, 3h, Modern wavefunction methods in electronic structure theory, Gelsenkirchen, October 2016,
- V. Ehrlacher, Lecture on "Theoretical results on the Progressive Generalized Decomposition algorithm", 2h, cours GdR AMORE, IHP, December 2016,
- C. Le Bris, Series of 6 one-hour lectures on Nonperiodic multiscale problems, Winter school on Calculus of Variations in Physics and Materials Science, Würzburg, Germany, 14 -19 February 2016,
- C. Le Bris, Series of 4 one-hour lectures on Stochastic homogenization, INI Workshop on "From the Grain to the Continuum: Two Phase Dynamics of a Partially Molten, Polycrystalline Aggregate", Cambridge, UK, 14 -15 March 2016,
- T. Lelièvre, Lectures on "Numerical methods in molecular dynamics" (4h30), Winterschool Universität Basel, Engelberg, February 2016,
- T. Lelièvre, Lectures on "Model reduction techniques for stochastic dynamics" (4h), Ecole GDR EGRIN, May 2016,
- T. Lelièvre, Lectures on "Stochastic differential equations in large dimension and numerical methods" (4h), RICAM Winterschool, Linz, December 2016,
- G. Stoltz, "A mathematical introduction to steady-state nonequilibrium systems", Spring school on Molecular Dynamics, Bad Belzig, April 2016.

Members of the project-team have presented posters in the following seminars, workshops and international conferences:

- A. Levitt, COSMOS workshop, Paris, February 2016,
- J. Roussel, NESCS, Sheffield, July 2016.

Members of the project-team have participated (without giving talks nor presenting posters) in the following seminars, workshops and international conferences:

- T. Hudson, SIAM Conference on Mathematical Aspects of Materials Science 2016, Philadelphie, May 2016,
- M. Josien, Winterschool on Stochastic Homogenization, Augsburg, Germany, February 2016,
- A. Levitt, IPAM semester "Understanding many-particle systems with machine learning", Los Angeles, September and November 2016,
- P.-L. Rothé, Workshop on "Recent developments in numerical methods for model reduction", Paris, France, November 2016,
- J. Roussel, MCMSki Conference, Lenzerheide, January 2016,
- J. Roussel, COSMOS Workshop, Paris, February 2016,
- J. Roussel, CEMRACS, CIRM, Marseille, July 2016,
- J. Roussel, IPAM Tutorial, Los Angeles, September 2016,
- P. Terrier, Summer school PISACMS, Paris, September 2016.

9.4. Popularization

- É. Cancès has delivered a conference in Nancy in November 2016, in the framework of the series of lectures "Sciences et société".
- A. Levitt participated in the "Young doctors" session of the Salon Culture & Jeux Mathématiques in May 2016.

MEMPHIS Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Selection

10.1.1.1. Reviewer

Charles-Henri Bruneau has reviewed several papers for the 9th International Conference on Computational Fluid Dynamics, July 10th-15th, Istanbul.

10.1.2. Journal

10.1.2.1. Member of the Editorial Boards

Angelo Iollo is in the advisory board of Acta Mechanica.

10.1.2.2. Reviewer - Reviewing Activities

Journal of Computational Physics, International Journal of CFD, Journal of Non-linear Analysis B, ASME Journal of Computational and Nonlinear Dynamics, Journal of Fluid Mechanics, Acta Mechanica, AIAA Journal, International Journal Numerical Methods in Fluids, Computers & Fluids, Journal of Engineering Mathematics, European Journal of Mechanics / B Fluids, Journal Européen de Systèmes Automatisés, Applied Mathematics and Computation. Nuclear Science and Engineering, Computer Methods in Applied Mechanics and Engineering, Journal of Theoretical Biology, Computational Optimization and Applications. Applied science, Meccanica.

10.1.3. Invited Talks

The invited talks are [15], [16], [17], [18].

10.1.4. Leadership within the Scientific Community

Angelo Iollo is responsible of the scientific policy of the scientific computing department of the LabEx CPU. This department gathers 60 researchers of the math lab IMB, of the computer science lab LaBRI, of the mechanics lab I2M and of the CEA.

10.1.5. Scientific Expertise

Michel Bergmann: reviewer of the PhD defense *Apprentissage d'estimateurs sans modèle avec peu de mesures - Application à la mécanique des fluides* de Kévin Kasper, Ecole normale supérieure de Cachan, 12/10/2016.

Michel Bergmann: member of the Inria Young Researchers Commission, which allocates PhD and Postdoc grants.

Lisl Weynans has participated to the *Comités de sélection* Cnam and Paris 5 Descartes, May 2016.

Angelo Iollo: Président du jury d'HDR de Heloise Beaugendre, Institut de Mathématiques de Bordeaux, université de Bordeaux, Mars 2016.

Angelo Iollo: Membre Jury HDR de Laurent Cordier, Institut P', université de Poitiers, novembre 2016.

Angelo Iollo: Membre du Jury de thèse de Loic Lacouture « Modélisation et simulations de mouvement de structures fines » département de mathématiques, juin 2016, Université Paris Sud.

Angelo Iollo: Président du jury de thèse de Olivier Gallinato, « Modélisation du processus cancéreux et méthodes superconvergentes de résolution de problèmes d'interface sur maillage cartésien », Institut de Mathématiques de Bordeaux, université de Bordeaux, novembre 2016.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Four members of the team are Professors or Assistant Professors at Bordeaux University and have a teaching duty, which consists in courses and practical exercises in numerical analysis and scientific computing. Michel Bergmann (CR) also teaches around 64 hours per year (practical exercises in programming for scientific computing).

10.2.2. Supervision

PhD in progress : Alice Raeli, Numerical Modelling for Phase Changing Materials, 12/06/2014, Azaiez M., Bergmann M., Iollo A.

PhD in progress : Claire Morel, Modélisation aérodynamique 3D d'une turbine éolienne, 01/01/2015, M., Bergmann M., Iollo A.

PhD in progress : Federico Tesser, Identification of dense suspensions rheology, 01/11/2014, Bergmann M., Iollo A.

PhD in progress : Baptiste Lambert, modélisation et simulations numériques des contacts dans des écoulements chargés en particules, 01/10/2015, Bergmann M., Weynans L.,

PhD in progress : Emanuela Abbate, Méthodes numériques pour problèmes stiff en mécanique des fluides et élasticité, 01/11/2015, Iollo, A.

PhD in progress : Mathias Braun, Modèles réduits et problèmes inverses pour l'étude de la résilience des réseaux d'eau potable, 01/10/2015, Iollo A. and Mortazavi I.

PhD in progress : Meriem Jedoua, Introduction d'une méthode efficace de capture d'interface permettant la localisation d'un grand nombre d'objets immergés dans un fluide. Applications à des solides rigides et des vésicules (membranes élastiques) immergés dans un fluide incompressible, 01/10/2013, Bruneau C.-H. and Maitre E.

2012-2016. Dr. Hervé Ung. Ancien ENSEIRB-MATMECA. Problèmes inverses dans les réseaux d'eau potable. Angelo Iollo, Iraj Mortazavi, Bourse Irstea.

10.2.3. Juries

Michel Bergmann has been reviewer of the PhD defense *Apprentissage d'estimateurs sans modèle avec peu de mesures - Application à la mécanique des fluides* de Kévin Kasper, Ecole normale supérieure de Cachan, 12/10/2016.

Lisl Weynans has participated to the PhD defense of Andrea Filippini, Inria Bordeaux, 14/12/2016.

Angelo Iollo: Président du jury d'HDR de Heloise Beaugendre, Institut de Mathématiques de Bordeaux, université de Bordeaux, mars 2016.

Angelo Iollo: Membre Jury HDR de Laurent Cordier, Institut P', université de Poitiers, novembre 2016.

Angelo Iollo: Membre du Jury de thèse de Loic Lacouture « Modélisation et simulations de mouvement de structures fines » département de mathématiques, juin 2016, Université Paris Sud.

Angelo Iollo: Président du jury de thèse de Olivier Gallinato, « Modélisation du processus cancéreux et méthodes super-convergentes de résolution de problèmes d'interface sur maillage cartésien », Institut de Mathématiques de Bordeaux, université de Bordeaux, novembre 2016,

10.3. Popularization

Lisl Weynans has co-organized the Journée "Filles et Maths, une équation lumineuse": may 11t 2016

Lisl Weynans has co-organized Journée Emploi Maths de l'Unité de Formation "Mathématiques et Interaction"

MEPHYSTO Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

D. Bonheure was General chair of the committee of the BRUXELLES-TORINO TALKS IN PDE'S MAY 2-5 2016 UNIVERSITÀ DEGLI STUDI DI TORINO DIPARTIMENTO DI MATEMATICA "GIUSEPPE PEANO"

9.1.2. Journal

9.1.2.1. Member of the Editorial Boards

D. Bonheure is associate editor at the Bulletin of the Belgian Mathematical Society - Simon Stevin (<http://projecteuclid.org/info/euclid.bbms>)

A. Gloria is associated editor at the North-Western European Journal of Mathematics (<http://math.univ-lille1.fr/~nwejm/>).

9.1.3. Invited Talks

D. Bonheure was invited speaker at

- 02/12/2016, Recent progress in Partial Differential Equations, Université Aix-Marseille
- 03/10/2016 au 07/10/2016, New trends in Partial Differential Equations, Centro De Giorgi, SNS Pisa
- 28/09/2016 au 30/09/2016, 3rd Conference on Recent Trends in Nonlinear Phenomena, Perugia
- 12/09/2016 au 17/09/2016, Partial Differential Equations and Related Topics – On the occasion of Giorgio Talenti's 75th birthday , Alghero

Stephan De Bièvre was invited speaker at

- Université Fourier, Grenoble, Mathematical Physics Seminar, April 2016
- Université de Nantes, Mathematical Physics Seminar, May 2016
- Spectral and Scattering theories in QFT, IV, Porquerolles, May 2016
- 11th AIMS Conference on Dynamical systems, ODE, and Applications, Orlando, July 2016
- Conference "Coherent States and their Applications: A Contemporary Panorama", CIRM Marseille, November 2016

A. Gloria was invited speaker at

- ENS Rennes, January 2016
- GAMM conference, Paris, January 2016
- Winter school on stochastic homogenization, Augsburg, February 2016
- British Mathematical Colloquium, Bristol, March 2016
- Courant Institute, NYU, New York, May 2016
- 15th European Mechanics of Materials Conference, Brussels, September 2016
- Probability seminar, Warwick, October 2016
- Workshop "Functional inequalities, heat kernels, and random processes", Oberwolfach institute, December 2016

M. Simon was invited speaker at

- YEP XIII: Large Deviations for Interacting Particle Systems and Partial Differential Equations, Eindhoven (Netherlands)
- Workshop in Stochastic Analysis, Universidade Federal de Campinas, Brazil
- Tokyo University, Probability Seminar
- Workshp "Large Scale Stochastic Dynamics", Oberwolfach institute, Germany

9.1.4. Leadership within the Scientific Community

D. Bonheure is member of the Executive board of the Belgian Mathematical Society.

S. De Bièvre is

- the scientific coordinator of the CEMPI (2012-2019),
- member of the drafting committee of the IDEX UDL, and of the delegation that presented the project to the jury in Paris (April 2015, January 2016),
- member of the Executive Committee of the International Association of Mathematical Physics (since 2012).

9.1.5. Scientific Expertise

D. Bonheure is a member of the ESF College of Expert Reviewers from 20 October 2016 to 19 October 2019

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Licence : Denis Bonheure, Integral and differential calculus, 46h, L1 (mathematics & physics), Université Libre de Bruxelles, Belgium

Licence : Denis Bonheure, Mathematics for management engineering, 30h, L1 (mathematics & physics), Université Libre de Bruxelles, Belgium

Licence : Guillaume Dujardin, Integral and differential calculus, 60h, L2 (mathematics & physics), Université Libre de Bruxelles, Belgium

Licence : Stephan De Bièvre, Probability, 15h, L2 (physics), Université Lille 1

Licence : Stephan De Bièvre, Probability, 50h, L3 (mathematics), Université Lille 1

Licence : Stephan De Bièvre, Financial mathematics, 30h, L1 (economics), Université Lille 1

Master : Denis Bonheure, Variational methods and PDEs, 30h, M2, Université Libre de Bruxelles, Belgium

Master : Antoine Gloria, Anderson localization, 30h, M2, Université Libre de Bruxelles, Belgium

Master : Antoine Gloria, Fluctuations in stochastic homogenization, 4h30, Doctoral course, YEP XIII, Eindhoven, Netherlands

9.2.2. Supervision

PhD in progress : Mitia Duerinckx, Topics in stochastic homogenization of PDEs, 01/10/2014, A. Gloria & S. Serfaty (NYU).

PhD in progress : Pierre Mennuni, Université Lille 1, 01/10/2016, S. De Bièvre, A. De Laire (Lille 1) & G. Dujardin

PhD in progress : Hussein Cheikh-Ali, Université Libre de Bruxelles and Université de Lorraine, D. Bonheure (ULB) & F. Robert (Nancy)

PhD in progress : Robson Alves do Nascimento Filho, Université Libre de Bruxelles, D. Bonheure (ULB)

9.2.3. Juries

S. De Bièvre was in the jury of the PhD theses of A. Newman (Loughborough, England), A. Vasseur (Nice) and J.P. Miqueu (Rennes).

9.3. Popularization

M. Simon gave a talk at ESPE (Ecole Supérieure du Professorat et de l'Education) during the week "Semaine des mathématiques", about the mathematical properties of the official soccer ball. Marielle Simon is part of the program "MathenJeans".

MOKAPLAN Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. Member of the Organizing Committees

V. Duval and F-X. Vialard have organized the CAVALIERI workshop which was held in the Inria Paris research center (October, 11th and 12th).

The team has organized the “Journées MokaTAO” together with the McTAO team on October 3rd and 4th. G. Peyré co-organized the SIGMA 2016 conference at the CIRM in Nov. 2016.

J-D. Benamou has co-organized Computational Optimal Transportation Workshop at CRM montreal (July 18-22).

10.1.2. Journal

10.1.2.1. Member of the Editorial Boards

Guillaume Carlier is in the board of Journal de l'école Polytechnique, Applied Mathematics and optimization (since 2016) and Mathematics and financial economics, with Filippo Santambrogio and Thierry Champion he co-edited a special issues of RICAM Series devoted to optimal transport. G. Peyré is editor for SIAM Journal of Imaging Sciences and Springer Journal of Mathematical Imaging and Vision. He co-edited a special issues of RICAM Series devoted to inverse problems.

10.1.2.2. Reviewer - Reviewing Activities

The members of the team are frequently reviewing papers in SIIMS (SIAM Journal on Imaging Sciences), JMAA (Journal of Mathematical Analysis and Applications), IPol (Image Processing Online), JVCI (Journal of Visual Communication and Image Representation), COCV, M2AN ... Discrete and computational geometry, Journal of the London Math Society, JOTA, JCP, “Information and Inference: A Journal of the IMA”, JMIV, Optimization Letters, PAMI, SIAM optimization and control, IPMI and MICCAI (leading conferences in medical imaging).

10.1.3. Invited Talks

V. Duval was invited to give talks at: the Oberwolfach workshop on Mathematical Imaging and Surface processing (January 2016), the Séminaire Parisien de Statistique (SEMSTAT, March 2016), the McGill-Mokalien Workshop on Numerical Optimal transport (July 2016) and the Demi-heure de Science at Inria Paris (October 2016).

G. Carlier gave seminars in Grenoble, Liège, Bielefeld and NYU, was plenary speaker at Smai-Mode conference (Toulouse), gave talks at the workshop Nonlinear problems from materials science and shape optimization (Pisa), workshop computational optimal transport (Montreal), workshop New Developments in Econometrics and Time Series (Madrid), MAFE Meeting (Bielefeld) and OTT16 (Pisa).

G. Peyré was plenary speaker at : Oxford Summer School on inverse problems (Jul 2016) ; Optimization without Border, (les Houches, Feb 2016) ; UCL workshop on sparse signal processing (Sep. 2016) ; workshop computational optimal transport (Montreal, Jul 2016) ; OTT16 (Pisa, Dec 2016).

J-D. Benamou talked at the Calculus of Variation Seminar in U. Paris Diderot (Nov.), he was invited speaker at OTT16 (Pisa, Dec 2016).

F-X. Vialard gave talks in séminaire de mathématiques appliquées, Cermics, ENPC, janvier; Geometric analysis theory in vision and control conference, Voss - Bergen, May; SIAM Imaging Science, Large Scale Inverse Problems in Medical Imaging, Albuquerque, May; Mathematics of Shapes and Applications, Singapore, July; Geometric Measure Theory: Analysis and non-smooth objects, CIMI analysis semester, Toulouse, September; MokaTAO meeting, Inria Paris, October; séminaire calcul des variations, Orsay, October; Journée transport optimal, équation de Monge-Ampère et applications, IHES, December.

10.1.4. Leadership within the Scientific Community

G. Peyré is in the scientific boards of Fondation Sciences Mathématiques de Paris (since 2013) ; Chaire CFM-ENS on Data Sciences (since 2016) ; Chaire Havas-Dauphine END (since 2013); Ceremade Paris-Dauphine (2013-2016)

10.1.5. Research Administration

J-D. Benamou is an elected member of the "Conseil Académique" of the PSL COMUE.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Licence : V. Duval, Analyse fonctionnelle, 27h équivalent TD, niveau L3, INSA Rouen-Normandie

Master : G. Peyré, Master 2 MVA on imaging and machine learning (Cachan) 30h.

Licence : F-X. Vialard, Algèbre linéaire 2, Université Paris-Dauphine, 30h.

10.2.2. Supervision

Internship : Gwendoline de Bie did her master internship (2nd year at ENSAE Paris-Tech) with G. Carlier on *Entropic regularization for multivariate quantile regression*,

Internship : Christine Durok *Une méthode itérative pour le problème inverse du réflecteur discret* J-D. Benamou Q. Mérigot

PhD in progress: Julien André, CIFRE PhD thesis with with the company OPTIS Grenoble-INP (co-supervision D. Attali, B. Thibert, Q. Mérigot)

PhD in progress : Jocelyn Meyron, *Extension of semi-discrete Optimal transport to other costs*, IED de Grenoble, Q. Mérigot, D. Attali and B. Thibert.

PhD in progress : Miao Yu, *Optimal Transport distances and Geophysical imaging* J-D. Benamou (co-direction J.-P. Vilotte, IPGP).

PhD in progress : Paul Catala, *Low-rank approaches for off-the-grid superresolution*, October 2016, G. Peyré and V. Duval.

PhD in progress : Lenaic Chizat, *Unbalanced Optimal Transport* , october 2014, F-X. Vialard and G. Peyré.

PhD in progress : Aude Genevay, *Optimal Transport for Machine Learning* , october 2015, J-D. Benamou and G. Peyré.

PhD in progress : Quentin Denoyelle, *Off-the-grid super-resolution: theory, algorithms and applications in fluorescence imaging*, October 2014, G. Peyré and V. Duval.

Postdoc completed: Dario Prandi, sub-Riemannian model for imaging, Oct. 2015 – Aug. 2016, G. Peyré and J-M Mirebeau

Postdoc completed: Thomas Gallouët, Fluid model and optimal transport, Oct. 2015 – Aug. 2016, Q. Mérigot and Yann Brenier.

Postdoc in progress: Roman Andreev, Numerical Methods for Mean Field Games , Mai 2015, Yves Achdou and J-D. Benamou.

PhD completed: Luca Nenna, Numerical Methods for Multi-Marginal Optimal Transportation, October 2013-December 2016, J-D. Benamou and G. Carlier.

PhD completed: Maxime Laborde, Systemes de particules en interaction, approche par flot de gradient dans l'espace de Wasserstein, september 2013-December 2016, G. Carlier.

PhD in progress: Jonathan Vacher, Machine learning approaches for neurosciences of the visual brain, October 2013-Jan 2017, G. Peyré and C. Monier.

Postdoc completed: Bernhard Schmitzer, fast algorithms for optimal transport, Oct. 2014-August 2016, G. Peyré.

Postdoc completed: Clarice Poon, *Support recovery using total variation and others sparse priors*, September 2015-August 2016, G. Peyré and V. Duval.

10.2.3. Juries

Vincent Duval was in the PhD committee of Romain Hug (Grenoble, December, 9).

J-D. Benamou and G. Carlier were in the PhD committee of Mathieu Laurière (Paris-Diderot, November 21), G. Carlier was on the Ph.D committee of Guo (Ecole Polytechnique) and the HDR of Silva (Limoges, referee) and Lamboley (Dauphine, coordinateur). G. Peyré was in the PhD committees of: Mitra Fatemi (EPFL, Feb. 2016), Morgane Henry (Grenoble, Mars 2016), Antoine Bonnefoy (Marseille, Mars 2016), Sébastien Combexelle (Toulouse, Oct. 2016), Augustin Cosse (UCL, Aout 2016), Irène Kaltenmark (ENS Cachan, Oct. 2016), Olivia Miraucourt (Reims, Oct. 2016), Fred Maurice Ngole (CEA, Oct. 2016), Lara Raad (ENS Cachan, Oct. 2016), Emmanuel Soubies (Nice, Oct. 2016), Luc Le Magoarou (Rennes, Dec. 2016), Chen Da (Paris, Dec. 2016).

10.3. Popularization

G. Peyré wrote the large audience articles : “Claude Shannon et la compression de données” on Image des Mathematiques ⁰ ; “Parcimonie, problemes inverse et échantillonnage compressé” in La Gazette des Mathématiciens (SMF). G. Peyré organized the conference in the honor of Claude Shannon in CIRM ⁰.

⁰<http://images.math.cnrs.fr/Claude-Shannon-et-la-compression-des-donnees>

⁰<http://www.fr-cirm-math.fr/hommage-claude-shannon.html>

NACHOS Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific events organisation

9.1.1.1. Member of the Conference Program Committees

Stéphane Lanteri, Claire Scheid and Wilfried Blanc (LPMC, Université Nice Sophia Antipolis, Nice) have co-organized the meeting "CompNano2016: Modelling and simulation for nanophotonics" that took place at Inria Sophia Antipolis-Méditerranée, October 5-7, 2016.

Stéphane Lanteri and Frédéric Valentin (LNCC, Petropolis, Brazil) have co-organized a mini-symposium on "Hybridized and multiscale methods for waves" in the framework of the Icosahom 2016 conference that took place in Rio de Janeiro, Brazil, June 27-July 1st, 2016.

9.1.2. Invited Talks

Claire Scheid, "Numerical modelling of light-matter interaction at the nanoscale", BioComp seminar, Simula, Oslo, Norway, November 9, 2016.

Claire Scheid, "A structure preserving numerical discretization framework for the Maxwell Klein Gordon equation in 2D", Workshop on Structure and Scaling in Computational Field Theories, University of Oslo, Norway, October 26-28, 2016.

Claire Scheid, "A high order discretization framework for the numerical modelling in nanoplasmonics", Colloque Couplages Numériques, LJAD, Université Nice Sophia Antipolis, Nice, France, September 27-29, 2016.

Claire Scheid, "A discontinuous Galerkin framework for the numerical modelling in nanoplasmonics" Workshop on Recent Advances in Discontinuous Galerkin Methods, University of Reading, UK, June 13, 2016.

Claire Scheid, "A discontinuous Galerkin framework for the numerical modelling of light-matter interaction at the nanoscale", 28th CEA-GAMNI Seminar on CFD, IHP, Paris, January 25-26, 2016.

Stéphane Lanteri, "Recent advances on a finite element type simulation method for nanoscale light/matter interactions", 8èmes Journées Scientifiques du C'Nano PACA, Porquerolles, France, May 25-27, 2016.

Stéphane Lanteri, "Development of finite element type simulation methods for nanoscale light/matter interactions", ONERA Palaiseau, France, June 15, 2016.

Stéphane Lanteri, "High order HDG method for frequency-domain electromagnetics", Institut fuer Physik, Humboldt-Universitaet zu Berlin, Germany, February 9-11, 2016.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Stéphane Descombes, *Scientific computing*, M1, 36 h, Université Nice Sophia Antipolis.

Stéphane Descombes, *Principal components analysis*, M2, 30 h, Université Nice Sophia Antipolis.

Stéphane Lanteri, *Computational electromagnetics*, MAM5, 20 h, Polytech Nice Sophia.

Claire Scheid, *Lectures and practical works, Analysis, Agrégation*, 27 h, Université Nice Sophia Antipolis.

Claire Scheid, *Lectures and practical works, Numerical Analysis, Agrégation*, 34 h, Université Nice Sophia Antipolis.

9.2.2. Supervision

PhD in progress: Alexis Gobé, *Multiscale hybrid-mixed methods for time-domain nanophotonics*, November 2016, Stéphane Lanteri.

PhD in progress: Nikolai Schmitt, *Numerical modeling of electron beam interaction with nanostructures*, October 2015, Stéphane Lanteri and Claire Scheid.

PhD in progress: Hao Wang, *High order DGTD method for multiscale electromagnetic wave propagation problems*, September 2015, Bin Li and Li Xu (UESTC, Chengdu, China) and Stéphane Lanteri.

NANO-D Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Scientific Events Selection

8.1.1.1. Reviewer

- Leonard Jaillet was a reviewer for the ICRA (International Conference on Robotics and Automation) and IROS (International Conference on Intelligent Robots and Systems) conferences, the WAFR (International Workshop on the Algorithmic Foundations of Robotics) workshop and the T-RO (Transactions on Robotics) journal.

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

- Stephane Redon is teaching INF585 (Introduction to C++) at Ecole polytechnique
- Stephane Redon is part of the teaching team of INF442 (Big data and high-performance computing) at Ecole polytechnique

8.2.2. Supervision

- Leonard Jaillet is advising the PhD of Minh Khoa Nguyen
- Sergei Grudin is advising the PhD of Alexandre Hoffmann
- Sergei Grudin is advising the PhD of Guillaume Pages
- Stephane Redon is co-advising the PhD of Krishna Kant Singh in collaboration with Jean-Francois Mehaut
- Stephane Redon is advising the PhD of Francois Rousse
- Stephane Redon is advising the PhD of Semehor Etorh
- Stephane Redon is co-advising the PhD of Zofia Trstanova in collaboration with Gabriel Stoltz (defended in november 2016)

POEMS Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Advisory and management activities

- P. Joly is a member of the scientific committee of CEA-DAM.
- E. Lunéville is the Head of UMA (Unité de Mathématiques Appliquées) at ENSTA ParisTech.

10.1.2. Scientific events organisation and selection

- E. Bécache, A. S. Bonnet-Ben Dhia, M. Bonnet, S. Fliss, C. Hazard, P. Joly and E. Lunéville are members of the scientific committee for the 13rd international conference on mathematical and numerical aspects of wave propagation (WAVES 2017), which will take place in Minneapolis in May 2017.
- A. S. Bonnet-Ben Dhia has been a member of the organizing committee of the workshop *NEW TRENDS IN THEORETICAL AND NUMERICAL ANALYSIS OF WAVEGUIDES* (40 participants) which has been held in Porquerolles in May 2016.
- S. Fliss has been a member of the organizing committee of the workshop *METAMATH* (40 participants) which has been held in Cargèse in November 2016.
- A. S. Bonnet-Ben Dhia has been a member of the organizing committee of the workshop on *Mathematical and Numerical Modeling in Optics* (70 participants) which has been held in Minneapolis in December 2016.

10.1.3. Journal

- A. S. Bonnet-Ben Dhia is associate editor of SINUM (SIAM Journal of Numerical Analysis) and SIAP (SIAM Journal of Applied Mathematics).
- M. Bonnet is associate editor of Engineering Analysis with Boundary Elements
- M. Bonnet is in the editorial board of Inverse Problems.
- M. Bonnet is in the editorial board of Computational Mechanics.
- M. Bonnet is in the editorial board of Journal of Optimization Theory and Application.
- P. Ciarlet is an editor of CAMWA (Computers & Mathematics with Applications).
- P. Ciarlet is an editor of ESAIM:M2AN (Mathematical Modeling and Numerical Analysis).
- P. Joly is an editor of ESAIM:M2AN (Mathematical Modeling and Numerical Analysis).
- P. Joly is a member of the editorial board of AAMM (Advances in Applied Mathematics and Mechanics).
- P. Joly is a member of the Book Series Scientific Computing of Springer Verlag.
- The team members regularly review papers for many international journals.

10.2. Teaching - Supervision

10.2.1. Teaching

Eliane Bécache

- *Méthode des éléments finis*, ENSTA ParisTech (2nd year)
- *Compléments sur la méthode des éléments finis*, ENSTA ParisTech, (2nd year)
- *Fonctions d'une variable complexe*, ENSTA ParisTech (1st year)

Marc Bonnet

- *Problèmes inverses*, Master MS2SC (Centrale Paris and ENS Cachan)
- *Méthodes intégrales*, Master TACS (ENS Cachan)
- *Outils élémentaires d'analyse pour les équations aux dérivées partielles*, ENSTA Paris-Tech (1st year)

Anne-Sophie Bonnet-Ben Dhia

- *Fonctions d'une variable complexe*, ENSTA ParisTech (1st year)
- *Propagation dans les guides d'ondes*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)
- *Théorie spectrale des opérateurs autoadjoints et applications aux guides optiques*, ENSTA ParisTech (2nd year)

Laurent Bourgeois

- *Outils élémentaires pour l'analyse des équations aux dérivées partielles*, ENSTA Paris-Tech (1st year)
- *Inverse problems: mathematical analysis and numerical algorithms*, (Master AN& EDP, Paris 6 and Ecole Polytechnique)

Stéphanie Chaillat

- *Introduction à la discrétisation des équations aux dérivées partielles*, ENSTA ParisTech (1st year)
- *Fonctions d'une variable complexe*, ENSTA ParisTech (1st year)
- *Equations intégrales et multipôles rapides*, Ecole doctorale MODES (Univ. Paris Est, Marne la Vallée)
- *Résolution des problèmes de diffraction par équations intégrales*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

Colin Chambeyron

- *Analyse réelle: optimisation libre et sous contraintes*, Dauphine University (1st year)
- *Outils mathématiques*, Dauphine University (1st year)
- *Algèbre linéaire*, Dauphine University (2nd year)

Patrick Ciarlet

- *Advanced Finite Element Methods*, ENSTA ParisTech (2nd year)
- *Parallel Scientific Computing*, ENSTA ParisTech (3rd year), and Master "Analysis, Modelling, Simulation" (M2)
- *Mathematical Models and their Discretisation in Electromagnetism*, ENSTA ParisTech (3rd year), and Master "Analysis, Modelling, Simulation" (M2)
- *Deputy Head of the Master's Program Analysis, Modelling, Simulation*, Paris-Saclay University

Sonia Fliss

- *Méthode des éléments finis*, ENSTA ParisTech (2nd year)
- *Introduction à la discrétisation des équations aux dérivées partielles*, ENSTA ParisTech (1st year).
- *Propagation des ondes dans les milieux périodiques*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)
- *Homogenisation*, Master ANEDP Paris 6 and Ecole Polytechnique (M2)

Christophe Hazard

- *Outils élémentaires d'analyse pour les équations aux dérivées partielles*, ENSTA Paris-Tech (1st year)
- *Théorie spectrale des opérateurs autoadjoints et applications aux guides optiques*, ENSTA ParisTech (2nd year)

Patrick Joly

- *Introduction à la discrétisation des équations aux dérivées partielles*, ENSTA ParisTech (1st year)
- *Propagation des ondes dans les milieux périodiques*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

Nicolas Kielbasiewicz

- *Programmation scientifique et simulation numérique*, ENSTA ParisTech (2nd year)
- *Parallélisme et calcul réparti*, ENSTA ParisTech (Master 2)

Marc Lenoir

- *Fonctions d'une variable complexe*, ENSTA ParisTech (2nd year)
- *Equations intégrales*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)
- *Méthodes asymptotiques hautes fréquences pour les équations d'ondes - course notes*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

Eric Lunéville

- *Introduction au Calcul Scientifique*, ENSTA ParisTech (2nd year).
- *Programmation scientifique et simulation numérique*, ENSTA ParisTech (2nd year).
- *Propagation dans les guides d'ondes*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

Jean-François Mercier

- *Outils élémentaires d'analyse pour les équations aux dérivées partielles*, ENSTA Paris-Tech (1st year)
- *Fonctions d'une variable complexe*, ENSTA ParisTech, ENSTA ParisTech (2nd year)
- *Théorie spectrale des opérateurs autoadjoints et application aux guides optiques*, ENSTA ParisTech (2nd year)

Axel Modave

- *Scientific parallel computing*, ENSTA ParisTech (3rd year) and Master "Modeling and Simulation" (M2)

10.2.2. Supervision

PhD: Marc Bakry, "Estimateurs a posteriori pour la résolution des problèmes de diffraction par équations intégrales", October 2016, Patrick Ciarlet and Sébastien Pernet.

PhD: Geoffrey Beck, "Modélisation de la propagation d'ondes électromagnétiques dans des câbles co-axiaux", March 2016, Patrick Joly et Sébastien Impériale

PhD: Mathieu Chamaillard, "Conditions aux limites effectives pour des revêtements minces périodiques", October 2011, Patrick Joly and Housseem Haddar

PhD: Rémi Cornaggia, "Asymptotique petit-défaut de fonctions-coût et son application en identification: justifications théorique et expérimentale, extensions", September 2016, Marc Bonnet and Bojan Guzina

PhD: Elizaveta Vasilevskaia, "Modes localisés dans les guides d'onde quantiques", July 2016, Patrick Joly

PhD: Valentin Vinales, "Analyse asymptotique des équations de Maxwell en présence de métamatériaux", September 2016, Sonia Fliss and Patrick Joly

PhD in progress : Zouhair Adnani , "Modélisation numérique tridimensionnelle des effets de site en interaction sol-structure par une méthode adaptée aux problèmes sismiques de très grande taille", October 2014, Marc Bonnet and Stéphanie Chaillat

PhD in progress : Antoine Bensalah, "Une approche nouvelle de la modélisation mathématique et numérique en aéroacoustique par les équations de Goldstein et applications en aéronautique", October 2014, Patrick Joly and Jean-François Mercier

PhD: Antoine Bera, "Conception de perturbations invisibles pour les ondes électromagnétiques ou acoustiques", October 2016, Anne-Sophie Bonnet-Ben Dhia and Lucas Chesnel

PhD in progress :Luca Desiderio, "Efficient visco-elastic wave propagation in 3D for high contrast media", October 2013, Stéphanie Chaillat and Patrick Ciarlet

PhD in progress :Léandre Giret, "Development of a domain decomposition method on non-conforming meshes: application to the modeling of a Reactivity-Initiated Accident (RIA) in a Pressurized Water Reactor (PWR)", October 2014, Patrick Ciarlet

PhD in progress :Sandrine Paolantoni, "Analyse spectrale et simulation numérique de la diffraction électromagnétique par des métamatériaux", October 2016, Christophe Hazard and Boris Gralak

PhD in progress :Laure Pesudo , "Modélisation de la réponse ultrasonore de défauts de type fissure par méthode BEM et couplage à un modèle de propagation - Application à la simulation des contrôle non destructifs", October 2014, Marc Bonnet and Stéphanie Chaillat

PhD in progress : Arnaud Recoquillay, "Identification de défauts dans un guide d'ondes en régime temporel", October 2014, Laurent Bourgeois

PhD in progress : Yohanes Tjandrawidjaja, "Modélisation de la propagation d'ondes guidées et de leur interaction avec des défauts localisés dans une plaque élastique anisotrope pour des applications en SHM", October 2016, Anne-Sophie Bonnet-Ben Dhia and Sonia Fliss

RAPSODI Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. Member of the Organizing Committees

The team organized the second edition of the conference *ABPDE Asymptotic Behavior of systems of PDE arising in physics and biology: theoretical and numerical points of view* in Lille (June 15-17, 2016). See <https://indico.math.cnrs.fr/event/939/>.

The kick-off meeting of the GdR MaNu was organized by Clément Cancès, Corinne Jamroz, and Nicolas Seguin (Univ. Rennes) in Saint-Valery-sur-Somme in October 2016. See <https://indico.math.cnrs.fr/event/1575/>.

Claire Chainais-Hillairet and Clément Cancès are members of the organizing committee of the eighth symposium on Finite Volumes for Complex Applications (FVCA8) to be held in Lille next June 2017. See <https://indico.math.cnrs.fr/event/1299/>.

I. Lacroix-Violet is in charge of the organization of the weekly seminary of the Numerical Analysis and Partial Differential Equations (ANEDP) research team at the Laboratoire Paul Painlevé, Université de Lille 1.

10.1.2. Journal

10.1.2.1. Member of the editorial boards

C. Chainais-Hillairet is a member of the editorial board of the North-Western European Journal of Mathematics (<http://math.univ-lille1.fr/nwejm/>) and of the International Journal on Finite Volumes (<http://www.i2m.univ-amu.fr/IJFV/>).

10.1.2.2. Reviewer - Reviewing activities

The members of the team RAPSODI reviewed numerous papers for numerous international journals.

10.1.3. Invited Talks

C. Cancès was an invited speaker at the international conference *Advanced numerical methods: recent developments, analysis, and applications* held in the framework of the IHP quarter on *Numerical Methods for PDEs*.

10.1.4. Scientific Expertise

C. Chainais-Hillairet and E. Creusé were experts for the HCERES.

10.1.5. Research Administration

Clément Cancès is the head of the MaNu Research Group (GdR MaNu, <http://gdr-manu.math.cnrs.fr/>) funded by the Institute for Mathematical Sciences and Interaction (INSMI) of the French National Center for Research (CNRS).

E. Creusé is AMIES Facilitator (Agency for the Interaction of Mathematics with Enterprise and Society) for the Northern France area. He is also the industrial representative of the Paul Painlevé Laboratory.

C. Chainais-Hillairet is head of the Commission Emplois de Recherche of the Lille - Nord Europe Inria research center.

Caterina Calgaro is a member of the Commission de la Formation et de la Vie Universitaire of the Academic Council of Université Lille 1.

Ingrid Lacroix-Violet, Benoît Merlet and Thomas Rey are members of the Conseil du Laboratoire Paul Painlevé.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

The group is strongly involved in teaching at the Université Lille 1. C. Calgaro and C. Chainais-Hillairet are in charge respectively of the Master of Mathematical Engineering and of the Master 2 of Scientific Computing, whereas E. Creusé is responsible of the "Cursus Master Ingénierie" in Mathematics, Lille 1 University. C. Cancès gives lectures at Polytech' UPMC.

10.2.2. Supervision

PhD : Pierre-Louis Colin has defended his PhD thesis on June 27, 2016. *Analyse numérique de modèles de dérive-diffusion : convergence et comportements asymptotiques*, Univ. Lille 1. advisors: C. Chainais-Hillairet and I. Lacroix-Violet.

PhD : Roberta Tittarelli, *A posteriori error estimators for Maxwell equations in potential and temporal formulations*, Univ. Lille 1, defended on September 27, 2016, advisors: E. Creusé & F. Piriou.

PhD in progress: Ahmed Aït Hammou Oulhaj, *Design and analysis of nonlinear numerical schemes for solving parabolic problems: application to porous media flows*, since 01/10/2014, advisors: C. Cancès & C. Chainais-Hillairet.

PhD in progress: Claire Colin, *Analyse numérique et simulations de modèles multifluides*, since 01/10/2015, advisors: C. Calgaro & E. Creusé.

PhD in progress: Luca Ferrari, *Line energies and applications to image reconstruction of partially masked objects*, since 01/09/2015, advisors: A. Chambolle (CNRS & CMAP, École Polytechnique) & B. Merlet.

PhD in progress: Nicolas Peton, *Numerical methods for a stratigraphic model with nonlinear diffusion and moving frontier areas*, 15/10/2015, C. Cancès, Q. H. Tran (IFPEN) & S. Wolf (IFPEN).

PhD in progress: Antoine Zurek, *Numerical and theoretical analysis of models describing the corrosion of materials*, since 01/10/2016, advisors: C. Chainais-Hillairet & B. Merlet.

10.2.3. Juries

C. Cancès reported on Mayya Groza's PhD thesis, defended on November 10, 2016 at Univ. Nice - Sophia Antipolis. Title: *Modélisation et discrétisation des écoulements diphasiques en milieux poreux avec réseaux de fractures discrètes*

C. Chainais-Hillairet reported on Polina Shpartko's PhD thesis, defended on June 6, 2016 at TU Wien. Title: *Analytical and numerical study of drift-diffusion models for spin-transport in semiconductors*. She was also a member of the jury of Toko Kamtchueng's PhD thesis, defended on December 7, 2016 at Université d'Orléans. Title: *Formulation généralisée du transport réactif pour les modèles de réseaux de pores saturés en eau*.

E. Creusé reported on Azba Riaz' PhD thesis, defended on April 4, 2016 at Univ. Cergy-Pontoise. Title: *A new discontinuous Galerkin formulation for time dependant Maxwell's equation : a priori and a posteriori error estimation*. He was also a member of the jury of Florent Dewez' PhD thesis defended on November 3, 2016 at Univ. Lille 1. Title: *Estimations sans pertes pour des méthodes asymptotiques et notion de propagation pour des équations dispersives*.

B. Merlet reported François Dayrens' PhD thesis, defended in July 1st, 2016 at University Lyon 1. Title: *Minimizing movement and gradient flows for second order geometric functionals*.

10.3. Popularization

C. Calgaro is in charge of the communication of "Laboratoire Paul Painlevé" and she is in charge of the relation between the University of Lille 1 and high schools. Accordingly, she organizes various events which promote mathematics among young peoples like

Les Mathématiques itinérantes (<http://mathematiques.univ-lille1.fr/Ouvertures/Mathematiques-itinerantes/>)

La semaine des Mathématiques (<http://mathematiques.univ-lille1.fr/Ouvertures/Mathematiques-itinerantes/>)

Stage en sciences pour les élèves de seconde (<http://www.univ-lille1.fr/etudes/stageseconde>)

Members of the team participate regularly in these actions.

Thomas Rey animates a Mathematics workshop (Math en Jeans) in the Adolphe Delégorgue middle school at Courcelles-lès-Lens.

APICS Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

- L. Baratchart gave a talk at the Shanks workshop “Mathematical methods for inverse magnetization problems arising in geosciences”, organized at Vanderbilt University (Nashville, USA), March 2016, a talk at “SEAM”, organized by the AMS at USF (Tampa, USA), a talk at “AppOpt” organized by ICIMAF in Havana (Cuba) <http://gama.uc3m.es/claroline1811/courses/APPOPT16/document/index.html> and a talk at ‘SIGMA’2016 (Signal-Image-Géométrie-Modélisation-Approximation), <http://programme-scientifique.weebly.com/1506.html>, organized by the SMAI at CIRM (Luminy, France).
- S. Chevillard gave a talk at the Shanks workshop “Mathematical methods for inverse magnetization problems arising in geosciences”, organized at Vanderbilt University (Nashville, USA), March 2016.
- B. Hanzon gave a presentation at the CDC 2016 pre-workshop on "realization theory and its role in system identification" (joint work with M. Olivi and R. Peeters) <https://sites.google.com/site/mihalypetreczky/workshop-cdc-2016>, Las-Vegas, USA, December 11.
- J. Leblond presented a communication at the above-mentioned Shanks Workshop, at the conference PICOF 2016 (Problèmes Inverses, Contrôle, Optimisation de Formes, Autrans, France, June 1-3 2016, <http://picof.sciencesconf.org/>), and at the seminar Mécanique, Modélisation Mathématique et Numérique, LMNO, Univ. Caen, France, December 5, 2016.
- M. Olivi gave a talk at the conference SIGMA’2016 (Signal-Image-Géométrie-Modélisation-Approximation). <http://programme-scientifique.weebly.com/1506.html>, Marseille, France, October 30-November 4.
- F. Seyfert presented a communication at the 22nd International Symposium on Mathematical Theory of Networks and Systems <https://sites.google.com/a/umn.edu/mtns-2016/>, USA, Mineapolis, July 12-15, 2016.
- K. Mavreas presented a communication at the Conference Advances in Lunar Magnetism: from Paleomagnetism to Dynamos, Cargèse, France, June 1-3, 2016, http://maglune.cerege.fr/?page_id=416. Together with C. Papageorgakis, they participated to the Semaine d’Étude Mathématiques-Informatique Entreprises, Grenoble, France, October 24-28, 2016. Grenoble.
- C. Papageorgakis presented a communication at the Conference PICOF 2016 and at the Science Day in BESA company, Munich, Germany, December 15, 2016.
- D. Ponomarev presented a communication at the above-mentioned Shanks Workshop and a poster at the Conference PICOF 2016.
- D. Martinez Martinez gave a seminar at the department ELEC of the Vrije Universiteit of Brussels (sept. 18) and at the Universidad Politécnica de Cartagena, ETSI (December 14). He gave a talk at the 2016 IEEE International Conference on Antenna Measurements & Applications, Syracuse (NY), USA, October 23-27.

8.1.1. Scientific Events Organisation

8.1.1.1. Member of the Organizing Committees

K. Mavreas and C. Papageorgakis were among the PhD students in charge of the PhD students Seminar within the Research Center.

J. Leblond was one of the co-organizers of the 3rd “Journée Mathématiques et Parité”, IHP, Paris, July 8, 2016, <http://postes.smai.emath.fr/apres/parite/journee2016/>.

8.1.2. Scientific Events Selection

8.1.2.1. Member of the Conference Program Committees

L. Baratchart was a member of the program committee of “Mathematical Theory of Network and Systems” (MTNS) 2016, Minneapolis, Minnesota, USA.

J. Leblond was a member of the Scientific Committee of the Conference PICO 2016.

8.1.3. Journal

8.1.3.1. Member of the Editorial Boards

L. Baratchart is sitting on the Editorial Board of the journals *Constructive Methods and Function Theory* and *Complex Analysis and Operator Theory*.

8.1.3.2. Reviewer - Reviewing Activities

L. Baratchart served as a reviewer for several journals (Annales Inst. Fourier, SIMA, Numerical Algorithms, Journal of Approx. Theory, Complex Variables and Elliptic Equations, ...)

J. Leblond was a reviewer for the journal *Multidimensional Systems and Signal Processing, Czechoslovak Mathematical Journal*.

M. Olivi was a reviewer for the journals *Automatica* and *IEEE Transactions on Automatic Control* and for the IEEE Conference on Decision and Control.

F. Seyfert was a reviewer for the journal *IEEE Microwave Theory and Techniques*.

8.1.4. Invited Talks

L. Baratchart was an invited speaker at the “25-th Summer Meeting in Mathematical Analysis”, organized by the Russian Academy of Sciences at the Euler Institute (St-Petersburg, Russia) <http://gauss40.pdmi.ras.ru/ma25/>, an invited speaker at the workshop “New Trends in Approximation Theory” organized by the CSM at the Fields Institute (Toronto, Canada) <http://www.fields.utoronto.ca/activities/16-17/approximation>, an invited speaker at the conference “Quasilinear equations, Inverse Problems and their Applications” organized by EAIP, RFBR, MIPT and Ecole Polytechnique at the Moscow Institute of Physics and Technology (Dolgoprudny, Russia) <http://www.cmap.polytechnique.fr/~novikov/miptip16/>, and an invited speaker at the “Complex Analysis Day” in Marne-la-Vallée.

S. Chevillard was invited to give a talk at the Fifth Approximation Days, International conference on constructive complex approximation, <http://math.univ-lille1.fr/~bbecker/ja2016/>, Lille, France, May 20, 2016.

J. Leblond was a plenary speaker at the Conference WiS&E 2016 (Waves in Sciences and Engineering), <http://gro.cinvestav.mx/index.php/wise2016>, Queretaro, Mexico, August 22-26, 2016, and an invited speaker at the Workshop SIGMA’2016 (Signal, Image, Geometry, Modelling, Approximation), <https://www.ceremade.dauphine.fr/~peyre/sigma2016/>, Luminy, France, October 31 - November 4, 2016.

F. Seyfert was invited to give a talk at the Workshop on Mathematical Aspects of Network Synthesis <http://www-control.eng.cam.ac.uk/Main/Workshop8>, Cambridge, UK, September 21-22, 2016.

8.1.5. Scientific Expertise

L. Baratchart is a member of the Mathematical panel of experts of ANR.

8.1.6. Research Administration

S. Chevillard was representative at the “comité de centre” and at the “comité des projets” (Research Center Inria-Sophia) until September 2016.

J. Leblond is an elected member of the “Conseil Scientifique” and of the “Commission Administrative Paritaire” of Inria. Until May, she was in charge of the mission “Conseil et soutien aux chercheurs” within the Research Center. She is also a member of the “Conseil Académique” of the Univ. Côte d’Azur (UCA).

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

Colles: S. Chevillard is giving “Colles” at Centre International de Valbonne (CIV) (2 hours per week).

8.2.2. Supervision

PhD: D. Ponomarev, *Some inverse problems with partial data*, Université Nice Sophia Antipolis, defended on June 14, 2016 (advisors: J. Leblond, L. Baratchart).

PhD: M. Caenepeel, *The development of models for the design of RF/microwave filters*, Vrije Universiteit Brussel (VUB), defended on October 19, 2016 (advisors: Y. Rolain, M. Olivi, F. Seyfert).

PhD in progress: C. Papageorgakis, *Conductivity model estimation*, since October 2014 (advisors: J. Leblond, M. Clerc, B. Lanfer).

PhD in progress: K. Mavreas, *Inverse source problems in planetary sciences: dipole localization in Moon rocks from sparse magnetic data*, since October 2015 (advisors: S. Chevillard, J. Leblond).

PhD in progress: D. Martinez Martinez, *Méthodologie et Outils de Synthèse pour des Fonctions de Filtrage Chargées par des Impédances complexes*, since October 2015, advisors: L. Baratchart and F. Seyfert.

PhD in progress: G. Bose, *Filter Design to Match Antennas*, since December 2016, advisors: F. Ferrero and F. Seyfert.

PhD in progress: S. Fueyo, *Cycles limites et stabilité dans les circuits*, since October 2016, advisors: L. Baratchart and J.B. Pomet.

8.2.3. Juries

L. Baratchart sat on the PhD defense committee of d’Alexey Agaltsov (Ecole Polytechnique, <http://www.adum.fr/script/detailSout.pl?mat=65164&site=PSaclay>) and on the committee for the defense of *Habilitation à diriger des recherches* of E. Abakumov (Université Paris-Est, Marne-la-Vallée, <http://umr-math.univ-mlv.fr/evenements/soutenances/?type=101>).

J. Leblond was a member of the “Jury d’admissibilité du concours CR” of the Inria Research Center and of the “Comités de Sélection” for professors at UNSA (Polytech Nice) and at the University Paris-Sud Orsay (March-May 2016). She was a reviewer for the PhD thesis of Silviu Ioan Filip, Univ. Lyon, December 2016.

F. Seyfert was a member of the PhD jury of Adam Cooman at the ELEC. department of the VUB (Bruxelles, Belgium). The PhD’s title is “Distorsion Analysis of Analog Electronic Circuits Using Modulated Signals”.

8.3. Popularization

- M. Olivi is responsible for Scientific Mediation and president of the Committee MASTIC (Commission d’Animation et de Médiation Scientifique) <https://project.inria.fr/mastic/>. She animated two half-day workshop sessions "activités débranchées" at "l’ESPE de Nice" for primary school students (March 08 & 15), 200 students each session). She participates to the event "la fête de la science" in Nice (October 13) for scholars and in Antibes (October 22 & 23, 6200 people). She gave a talk "180°" at the "Journées Scientifiques Inria" in Rennes.
- K. Mavreas and C. Papageorgakis actively participated to events organized by the Committee MASTIC (Fête de la Science, ...).

BIPOP Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

- Guillaume James, Chairman of the Euromech Colloquium 580 “Strongly Nonlinear Dynamics and Acoustics of Granular Metamaterials”, 11 July-13 July 2016, Grenoble. <http://580.euromech.org/>

9.1.1.2. Member of the Organizing Committees

- Gilles Daviet, Alexandre Vieira, Jose Morales, Bernard Brogliato, members of local organization committee of the Euromech Colloquium 580 “Strongly Nonlinear Dynamics and Acoustics of Granular Metamaterials”, 11 July-13 July 2016, Grenoble. <http://580.euromech.org/>.

9.1.2. Scientific Events Selection

9.1.2.1. Member of the Conference Program Committees

- Vincent Acary, member of ENOC (European Nonlinear Oscillations Conference) Committee.
- Florence Bertails-Descoubes, member of the ACM SIGGRAPH Asia 2016 Technical Program Committee.
- Pierre-Brice Wieber, Associate Editor for Humanoids 2016 and ICRA 2017.

9.1.3. Journal

9.1.3.1. Member of the Editorial Boards

- Bernard Brogliato, Associate Editor at Nonlinear Analysis: Hybrid Systems
- Bernard Brogliato, Associate Editor at ASME Journal of Computational and Nonlinear Dynamics
- Pierre-Brice Wieber, Associate Editor at IEEE Transactions on Robotics

9.1.3.2. Reviewer - Reviewing Activities

- Bernard Brogliato, reviewer for IEEE Transactions on Automatic Control, Multibody System Dynamics, SIAM Journal on Optimization and Control, European Journal of Mechanics A/Solids, Nonlinear Dynamics, ASME Journal of Computational and Nonlinear Dynamics.
- Florence Bertails-Descoubes, reviewer for ACM Transactions on Graphics, ACM SIGGRAPH, ACM SIGGRAPH Asia, Eurographics, Symposium on Computer Animation, Computer-Aided Design, Computer-Aided Geometric Design, International Journal of Solids and Structures.
- Arnaud Tonnelier, reviewer for Scientific Reports, SIADS, PRE, PhysicaD.
- Vincent Acary, reviewer for several journals in Mechanics and Automatic Control.

9.1.4. Invited Talks

- Bernard Brogliato, invited seminar at Mathematics Department, INSA de Lyon, 09 June 2016 (contact: A. Petrov).

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Master 1 : Florence Bertails-Descoubes, Module IRL (découverte recherche), supervision stage Mickaël Ly, ENSIMAG 2A (Grenoble INP)

9.2.2. Supervision

HdR : Vincent Acary, Analysis, simulation and control of nonsmooth dynamical systems, Université de Grenoble Alpes, 16 juillet 2015.

PhD : Narendra Akhadkar, Modélisation numérique des mécanismes. Influence des jeux, de la déformation et des impacts multiples, Université Grenoble-Alpes, CIFRE I-MEP2 avec Schneider-Electric, 25 avril 2016, Vincent Acary et Bernard Brogliato

PhD : Gilles Daviet, Modèles et Algorithmes pour la Simulation du Contact Frottant dans les Matériaux Complexes : Application aux Milieux Fibreux et Granulaires, Université Grenoble-Alpes, 15 décembre 2016, Florence Bertails-Descoubes.

PhD : José Eduardo Morales Morales, Ondes localisées dans des systèmes mécaniques discrets excitables, Université Grenoble-Alpes, 29 novembre 2016, Guillaume James et Arnaud Tonnelier

PhD in progress : Alexandre Vieira, Commande Optimale de Systèmes Linéaires de Complémentarité, 01 octobre 2015, Christophe Prieur et Bernard Brogliato.

PhD in progress : Alejandro Blumentals, Analyse et Simulation de Systèmes Mécaniques avec Contact Frottant, 01 octobre 2013, Florence Bertails-Descoubes et Bernard Brogliato.

PhD in progress: Nestor Bohorquez Dorante, Control of Biped Robots, 01 octobre 2015, Pierre-Brice Wieber.

PhD in progress: Nahuel Vila, Control of Biped Robots, 01 octobre 2016, Pierre-Brice Wieber.

9.2.3. Juries

- Bernard Brogliato, member of Habilitation à Diriger des Recherches committee of Constantin Irinel Morarescu, CRAN Nancy (MCF université de Nancy), 03 novembre 2016.
- Bernard Brogliato, member of Habilitation à Diriger des Recherches committee of Stéphane Redon, Inria Grenoble (CR Inria), 27 mai 2016.
- Bernard Brogliato, member of Ph.D. Thesis committee of T.L. Nguyen (15 janvier 2016), INSA de Rennes (directeurs de thèse M. Hjjaj and C. Sansour).
- Bernard Brogliato, member of Ph.D. Thesis committee of O. Montano (20 mai 2016), CICESE Ensenada, Mexico (directeur de thèse Y. Orlov).
- Arnaud Tonnelier, member of Ph.D. Thesis committee of Catalina Vich Llompart (août 2016), Universitat de les Illes Balears (directeurs de thèse : Antoni Guillamon Grabolosa (UPC) and Dr. Prohens Rafel Sastre (UIB)).
- Arnaud Tonnelier, member of Ph.D. Thesis committee of Elif Köksal Ersöz (décembre 2016), Université Pierre et Marie Curie (directeurs de thèse: F. Clement et J.P. Françoise).

9.3. Popularization

- Modélisation de matériaux granulaires (Florence Bertails-Descoubes, Gilles Daviet) : participation à l'écriture d'un article court pour le CNRS, "Représenter du sable sans poudre aux yeux", <http://www.cnrs.fr/ins2i/spip.php?article2175>

COMMANDS Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific events selection

10.1.1.1. Member of the conference program committees

- F. Bonnans, 14th EUROPT Workshop on Advances in Continuous Optimization, Poznań, July 3-6, 2016.

10.1.2. Journal

10.1.2.1. Member of the editorial boards

- F. Bonnans: Corresponding Editor of “ESAIM:COCV” (Control, Optimization and Calculus of Variations), and Associate Editor of “Applied Mathematics and Optimization”, “Optimization, Methods and Software”, and “Series on Mathematics and its Applications, Annals of The Academy of Romanian Scientists”.

10.1.2.2. Reviewer - Reviewing activities

Reviews for major journals in the field such as Applied Mathematics and Optimization, Automatica, J. Diff. Equations, J. of Optimization Theory and Applications the SIAM J. Optimization, SIAM J. Control and Optimization, Inverse problems, Journal of Numerical Mathematics, Operations Research, Optimization, Process Control, Math. Reviews.

10.1.3. Invited talks

- A. Kröner: Seminars in U. Konstanz, U. Hamburg, 2016.
- Minisymposium Numerical methods for time-dependent transportation and optimal control problems. Computational Methods in Applied Mathematics (CMAM), Jyväskylä, Finland, July 31-Aug. 6, 2016;
- Minisymposium 'Optimal Control - Theory and Applications', Emerging Trends in Applied Mathematics and Mechanics, Perpignan, May 30-June 3, 2016;
- Minisymposium 'Numerical aspects of controllability of PDEs and inverse problems', CANUM (Congrès d'Analyse Numérique), Obernai, May 9-13, 2016;
- A. Kröner: Workshop on *Numerical methods for Hamilton-Jacobi equations in optimal control and related fields*, Linz, Austria, Nov., 2016;

10.1.4. Leadership within the scientific community

- F. Bonnans: French representative to the IFIP-TC5 committee (International Federation of Information Processing; TC7 devoted to System Modeling and Optimization).
- F. Bonnans: member of the PGM board and Steering Committee (Gaspard Monge Program for Optimization and Operations Research, EDF-FMJH).
- F. Bonnans: member of the Broyden Prize committee (from the Journal Optimization Methods and Software).

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Master :

F. Bonnans: *Numerical analysis of partial differential equations arising in finance and stochastic control*, 36h, M2, Ecole Polytechnique and U. Paris 6, France.

F. Bonnans: *Optimal control*, 15h, M2, Optimization master (U. Paris-Saclay) and Ensta, France.

F. Bonnans: *Stochastic optimization*, 15h, M2, Optimization master (U. Paris-Saclay), France.

A. Kröner : *Optimal control of partial differential equations*, 20h, M2, Optimization master (U. Paris-Saclay), France.

E-learning F. Bonnans, several lecture notes on the page
<http://www.cmap.polytechnique.fr/~bonnans/notes.html>

10.2.2. Supervision

- PhD : Benjamin Heymann, Dynamic optimization with uncertainty; application to energy production. Polytechnique fellowship, defense October 2016, F. Bonnans and A. Jofre.
- PhD in progress : Cédric Rommel, Data exploration for the optimization of aircraft trajectories. Started November 2015, F. Bonnans and P. Martinon. CIFRE fellowship (Safety Line).
- PhD in progress : Arthur Le Rhun, Optimal and robust control of hybrid vehicles (IFPEN fellowship), started Sept. 2016, F. Bonnans and P. Martinon.

10.2.3. Juries

- HDR Juries: F. Silva (Limoges), A. Rondepierre (Toulouse, rapporteur).

10.3. Popularization

- J.F. Bonnans: *Comment optimiser la gestion d'un micro-réseau électrique intelligent ?* Cahier de l'Institut Louis Bachelier N. 23 (2016), p. 12-13.

DISCO Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Scientific Events Organisation

8.1.1.1. General Chair, Scientific Chair

- Catherine Bonnet is together with Alexandre Chapoutot (ENSTA ParisTech) and Paolo Mason (L2S) the co-organizer of the Working Group Shy of Digicosme on the Plateau de Saclay.
- Catherine Bonnet was together with Alexandre Chapoutot and Laurent Fribourg (ENS Cachan) the co-organizer of the DigiCosme Spring School 2016 on Hybrid Systems, May 9-13, ENSTA ParisTech.
- Sorin Olaru was the Scientific organizer of the Workshop "Interpolation-based techniques for constrained control: from improved vertex control to robust model predictive control alternatives" at ECC 201

8.1.2. Scientific Events Selection

Frédéric Mazenc was Associate Editor for the conferences 2017 American Control Conference, Seattle, USA and the 55th IEEE Conference on Decision and Control, Las Vegas, USA, (2016).

Ali Zemouche was Associate Editor for the conferences 2017 American Control Conference, Seattle, USA, and the 55th IEEE Conference on Decision and Control, Las Vegas, USA, (2016).

8.1.2.1. Member of the Conference Program Committees

Catherine Bonnet was a member of the International Program Committee of the IFAC Conference on Time-Delay Systems - IFAC TDS2016.

Sorin Olaru was a member of the conference program committee: International Conference on System Theory, Control and Computing - ICSTCC 2016.

Guillaume Sandou was a member of the program committee of the 2016 IEEE Symposium on Computational Intelligence in Production and Logistics Systems, Athens, Greece.

Ali Zemouche was a member of the International Program Committee of the IFAC ACD16 Conference, Lille, November 2016.

Ali Zemouche is a member of the Technical Program Committee of the 2017 IEEE - ACC Conference, Seattle, May 2017.

8.1.2.2. Reviewer

The team reviewed many papers for international Conferences eg IEEE CDC 2016; IEEE ACC 2016, IFAC TDS 2016

8.1.3. Journal

8.1.3.1. Member of the Editorial Boards

Frédéric Mazenc is Member of the Mathematical Control and Related Fields editorial board.

Frédéric Mazenc is Member of the European Journal of Control editorial board.

Frédéric Mazenc is Associate Editor for the Asian Journal of control.

Frédéric Mazenc is Associate Editor for the Journal of Control and Decision.

Frédéric Mazenc is Associate Editor for IEEE Transactions on Automatic Control.

Sorin Olaru is a Member of the editorial board of IMA Journal of Mathematical Control and Information

Ali Zemouche is Member of the European Journal of Control editorial board.

Ali Zemouche is Associate Editor for SIAM Journal on Control and Optimization.

8.1.3.2. Reviewer - Reviewing Activities

The team reviewed many papers for international journals of mathematics, e.g. European Journal of Control, Automatica, IEEE Trans. Aut. Contr., SICON, IEEE Trans. on Control Systems Technology, Journal of Process Control, Asian Journal of Control, transactions on control systems and technology journal as well as a book for Springer.

8.1.4. Invited Talks

Frédéric Mazenc was a speaker of 'The 5th International Symposium on Positive Systems'. September 14th-16th 2016, Università Campus Bio-Medico di Roma, Italy. Title of his talk: *Stability analysis of a differential-difference system through a linear Lyapunov functional design*.

Frédéric Mazenc was a plenary speaker of the workshop 'Stability and Control of Infinite-Dimensional Systems', 12-14 October 2016, Passau, Germany. Title of his talk: *New trajectory based approach for systems with delay: application to the reduction model technique*.

8.1.5. Leadership within the Scientific Community

Catherine Bonnet and Sorin Olaru are members of the IFAC Technical Committees Robust Control.

Catherine Bonnet is a member of the IFAC Technical Committees Distributed Parameter Systems and Non linear Control Systems. She is a member of the SIAG/CST (SIAM Activity group Control System Theory) steering committee.

For 'The 5th International Symposium on Positive Systems', September 14th-16th 2016, Università Campus Bio-Medico di Roma, Frédéric Mazenc organized an invited session entitled *Positive systems with delay*.

8.1.6. Scientific Expertise

Catherine Bonnet is a member of the Evaluation Committee of Inria since September 2015.

Catherine Bonnet has been an expert for ANR.

Since 2014, Frédéric Mazenc is an expert for the FNRS (Belgium). His mission consists in evaluating research projects funded by this institution.

Since 2012, Frédéric Mazenc is a, expert for the ANVUR (National Agency for the Evaluation of Universities and Research Institutes, Italy). His mission consists in evaluating the contribution of Italian scientists.

Since 2011, Frédéric Mazenc is a, expert for the Romanian National Council for Development and Innovation (Romania). His mission consists in evaluating research projects funded by the this institution.

8.1.7. Research Administration

Catherine Bonnet is a Management Committee member of the COST action *Fractional-order systems; analysis, synthesis and their importance for future design*, member of the board of Directors of the consortium Cap'Maths, of the administration council of the association *Femmes et Mathématiques*, of the Inria Parity Committee (created in 2015) and of the *Cellule veille et prospective* of Inria.

Frédéric Mazenc and Sorin Olaru are members of the Conseil du Laboratoire of Laboratoire des Signaux et Systèmes (L2S).

Frédéric Mazenc is president of the commission scientifique du CRI Saclay-Ile-de-France.

Frédéric Mazenc is member of the Bureau du Comité des Projets du CRI Saclay-Ile-de-France.

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

Licence : Guillaume Sandou, Signals and Systems, 87h, L3, CentraleSupélec
 Licence : Guillaume Sandou, Mathematics and programming, 18h, L3, CentraleSupélec
 Licence : Sorin Olaru, Numerical methods and Optimization, 24h, niveau M1, SUPELEC, France
 Licence : Sorin Olaru, Hybrid systems, 16h, M2, SUPELEC, France
 Licence : Sorin Olaru, Automatic Control, 8h, M1, SUPELEC, France
 Licence : Sorin Olaru, Signals and systems, 8h, L3, SUPELEC, France
 Licence : Sorin Olaru, Embedded systems, 8h, M1, Centrale Paris, France
 Master : Dina Irofti, Java programming, 40h, M2, Paris-Sud
 Master : Dina Irofti, Industrial computing, 16h, M1, Paris-Sud
 Master : Guillaume Sandou, Automatic Control, 8h, M1, CentraleSupélec
 Master : Guillaume Sandou, Numerical methods and optimization, 28h, M1 and M2, Centrale-Supélec
 Master : Guillaume Sandou, Modelling and system stability analysis, 21h, M2, CentraleSupélec
 Master : Guillaume Sandou, Control of energy systems, 22h, M2, CentraleSupélec
 Master : Guillaume Sandou, Robust control and mu-analysis, 9h, M2, CentraleSupélec
 Master : Guillaume Sandou, Systems identification, 32h, M2, ENSTA
 Master : Guillaume Sandou, System Analysis, 22h, M2, Ecole des Mines de Nantes
 F. Mazenc: March 2016. Teaching (in English) for the *International Graduate School on Control* of the EECI (Master level). 21 hours). Subject : introduction to the ordinary differential equations, Lyapunov design, control and observation of nonlinear dynamical systems.

8.2.2. Supervision

PhD in progress : Saeed Ahmed, Bilkent University, Stability analysis and control of switched systems with time-delay. Supervisor : Hitay Ozbay. Co-supervisor : Frédéric Mazenc.
 PhD in progress : Nadine Aoun, Modélisation de réseaux de chaleur et gestion avancée multi-échelles de la production, de la distribution et de la demande. Supervisor: Guillaume Sandou.
 PhD in progress : Caetano Cardeliqio, Stability and stabilization of (possibly fractional) systems with delays. French Supervisor : Catherine Bonnet, Brazilian Supervisor : André Fioravanti.
 PhD in progress : Walid Djema, Analysis of an AML model enabling evaluation of polychemiotherapies delivered in the case of AML which have a high level of Flt-3 duplication (Flt-3-ITD). Supervisor : Catherine Bonnet. Co-supervisors : Jean Clairambault and Frédéric Mazenc.
 PhD : Sophie Frasnado, Optimisation globale des lois de commande des autodirecteurs sur critère optronique : application à un autodirecteur à double phase de stabilisation. Supervisors : Gilles Duc et Guillaume Sandou, soutenue le 6 décembre 2016
 PhD in progress : Nicolo Gionfra, Optimisation du pilotage d'un parc d'énergies renouvelables avec stockage et du réseau de distribution sous-jacent. Supervisors: Houria Siguerdidjane et Guillaume Sandou.
 PhD : Mohamad Koteich, Modélisation et Observabilité des Machines Electriques en vue de la commande sans capteur mécanique. Supervisors: Gilles Duc et Guillaume Sandou, soutenue le 18 mai 2016.
 PhD in progress : Mohamed Lotfi Derouiche, Sur l'optimisation par métaheuristiques avancées de lois de commande prédictive non linéaire. Supervisor: Soufienne Bouallegue, Joseph Haggège et Guillaume Sandou.
 PhD in progress : Juliette Pochet, Analyse de performance et de résilience d'une ligne de type RER équipée d'un automatisme CBTC. Supervisor: Guillaume Sandou.

8.2.3. Juries

Catherine Bonnet was a reviewer of the PhD thesis of Marine Jacquier entitled "*Mathematical modeling of the hormonal regulation of food intake and body weight - Application to caloric restriction and leptin resistance*", University of Lyon 1, February 5th 2016.

Catherine Bonnet was a member of several recruiting committees: Junior Researcher competition in Inria Grenoble - Rhône-Alpes, Senior Researcher competition at Inria, Professor competition at University of Perpignan, Professor competition at CentraleSupélec.

Frédéric Mazenc was a reviewer of the PhD thesis of Youssef Bourfia, entitled "*Modélisation et Analyse de Modèles en Dynamique Cellulaire avec Applications à des Problèmes Liés aux Cancers*", (University of Cadi Ayyad de Marrakech and University of Pierre et Marie Curie, December 28, 2016).

Frédéric Mazenc was an examiner of the HDR of Ali Zemouche, entitled "*State Observer Design and Stabilization of Nonlinear Systems via LMIs*". Centre de Recherche en Automatique de Nancy, UMR 7039 CNRS - Université de Lorraine, December 01, 2016.

Sorin Olaru has been appointed as evaluator for V. Grelet's PhD thesis at University of Lyon. The thesis was defended on February 18th 2016.

Guillaume Sandou was a reviewer of the PhD thesis *Modélisation dynamique et gestion avancée de réseaux de chaleur*, Loic Giraud, Université Grenoble Alpes

Guillaume Sandou was a member of the following PhD theses committees:

- Roman Le Goff Latimier, "*Gestion et dimensionnement d'une flotte de véhicules électriques associée à une centrale photovoltaïque : co-optimisation stochastique et distribuée*", 26 septembre 2016.
- Sinziana Carloganu, "*Evaluation des produits d'effacements réalisés sur un ensemble de consommateurs d'électricité par identification d'un modèle global*", 8 décembre 2016.

Ali Zemouche was an examiner of two PhD theses under the supervision of Professor Hieu TRINH from Deakin University, Geelong, Australia:

- The PhD thesis of Minh Cuong Nguyen, entitled "*State Observer Design Methods for Lipschitz Time-Delay Systems*", Deakin University, Geelong, Australia, September 15, 2016.
- The PhD thesis of Ngoc Thanh Pham, entitled "*Robust Load Frequency Control of Interconnected Grids with Electric Vehicles*", Deakin University, Geelong, Australia, December 9, 2016.

GECO Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. Member of the Organizing Committees

- Mario Sigalotti was member of the organizing committee of the *Workshop on switching dynamics & verification*, IHP, Paris, January 28-29, 2016.
- Ugo Boscain and Mario Sigalotti were member of the organizing committee of the *Workshop on quantum dynamics & control*, IHP, Paris, May 23-24, 2016.

9.1.2. Journal

9.1.2.1. Member of the Editorial Boards

- Ugo Boscain is Associate Editor of SIAM Journal of Control and Optimization
- Ugo Boscain is Managing Editor of Journal of Dynamical and Control Systems
- Mario Sigalotti is Associate Editor of Journal of Dynamical and Control Systems
- Ugo Boscain is Associate Editor of ESAIM Control, Optimisation and Calculus of Variations
- Ugo Boscain is Associate Editor of Mathematical Control and Related Fields
- Ugo Boscain is Associate editor of Analysis and Geometry in Metric Spaces

9.1.3. Invited Talks

- Mario Sigalotti gave an invited talk at the “ExQM Miniworkshop: Mathematics of Quantum Control”, Munich, Germany, February 2016.
- Ugo Boscain gave an invited talk at the conference “Geometric Analysis in Control and Vision Theory”, Voss, Norway, May 2016.
- Ugo Boscain gave an invited talk at the seminar of the *Département de Mathématiques d’Orsay*, May 2016.
- Ugo Boscain gave an invited talk at the conference “Recent Trends in Differential equations”, Aveiro, Portugal, June 2016.
- Mario Sigalotti gave an invited talk at the *Séminaire de géométrie sous-riemannienne*, IHP, Paris, June 2016.
- Ugo Boscain gave the opening talk at the conference “Geometry, PDE’s and Lie Groups in Image Analysis”, Eindhoven, The Netherlands, August 2016.
- Mario Sigalotti gave an invited talk at the seminar of the *Dipartimento di Matematica - Università degli Studi di Trento*, Italy, September 2016.
- Ugo Boscain gave an invited talk at the conference “Nouvelles directions en analyse semiclassique”, Chalès, France, December 2016.

9.1.4. Research Administration

- Mario Sigalotti is member of the IFAC technical committee “Distributed Parameter Systems”.
- Mario Sigalotti is member of the steering committee of the *Institut pour le Contrôle et la Décision* of the Idex Paris-Saclay.

9.2. Teaching - Supervision - Juries

9.2.1. Supervision

- PhD (concluded): Guiherme Mazanti, “Stabilité et taux de convergence pour les systèmes à excitation persistante” [1], supervisors: Yacine Chitour, Mario Sigalotti. Discussed on September 2016.
- PhD in progress: Ludovic Sacchelli, “Sub-Riemannian geometry, hypoelliptic operators, geometry of vision”, started in September 2015, supervisors: Ugo Boscain, Mario Sigalotti.
- PhD in progress: Nicolas Augier, “Contrôle adiabatique des systèmes quantiques”, started in September 2016, supervisors: Ugo Boscain, Mario Sigalotti.
- PhD in progress: Mathieu Kohli, “Volume and curvature in sub-Riemannian geometry”, started in September 2016, supervisors: Davide Barilari, Ugo Boscain.
- PhD in progress: Jakub Orłowski, “Modeling and steering brain oscillations based on in vivo optogenetics data”, started in September 2016, supervisors: Antoine Chaillet, Alain Destexhe, and Mario Sigalotti.

9.2.2. Juries

- Ugo Boscain was member of the commission for the PhD defense of Valentina Franceschi, Padue, March 2016.
- Mario Sigalotti was member of the commission for the PhD defense of Francesco Boarotto, SISSA, Trieste, September 2016.
- Ugo Boscain was reviewer and member of the commission for the PhD defense of Jérémy Rouot, Nice, November 2016.

9.3. Popularization

Ugo Boscain gave a concert-seminar at the event “Musique & Mathématiques 2016”, Besançon, November 2016.

I4S Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Selection

10.1.1.1. Member of the Conference Program Committees

J. Dumoulin is

- member of the scientific committee of the GI Division (Geosciences Instrumentation and Data Systems) of EGU (European Geosciences Union) for infrastructure instrumentation and monitoring since April 2013. (<http://www.egu.eu/gi/structure/>)
- member of the scientific committee of QIRT (quantitative Infrared Thermography) since February 2014 (<http://www.qirt.org/>)
- organizer and chair of a session at EGU 2016 (<http://www.egu2016.eu/>).

L. Mevel

- is member of the EWSHM scientific committee.
- is member of the IOMAC scientific committee.

V. Le Cam is head and general secretary of the EWSHM scientific committee.

Q. Zhang:

- Member of IFAC Technical Committee on Modelling, Identification and Signal Processing.
- Member of IFAC Technical Committee on Fault Detection, Supervision and Safety of Technical Processes.

M. Doehler

- was organizer of an invited session at EWSHM 2016.
- session organizer at two COST workshops (<http://www.cost-tu1402.eu/events>).

10.1.1.2. Reviewer

V. Le Cam was session chairman for the EWSHM 2016 in Bilbao

L. Mevel was reviewer and session chairman for the EWSHM 2016 in Bilbao, and reviewer for IFAC WC 2017

Q. Zhang was reviewer for CDC 2016, IFAC WC 2017

M. Doehler was reviewer and session chairman for EWSHM 2016 in Bilbao, and reviewer for MED 2016, IFAC WC 2017

J. Dumoulin was reviewer and session chairman for QIRT 2016 and at EGU 2016 in GI division

10.1.2. Journal

10.1.2.1. member of the Editorial Boards

L. Mevel is member of the editorial board of journal of Mathematical Problems in Engineering.

L. Mevel is member of the editorial board of journal of Shock and Vibration.

Q. Zhang is member of the editorial board of the journal of Intelligent Industrial Systems.

J. Dumoulin is member of the editorial board of the journal of Quantitative Infrared Thermography.

J. Dumoulin is member of the editorial board of the journal of Geoscientific Instrumentation and Data Systems.

10.1.2.2. Reviewer - Reviewing activities

X. Chapeleau was reviewer for Journal: Sensors and Journal of Civil Structural Health Monitoring

L. Mevel was reviewer for Mechanical Systems and Signal Processing, journal of Sound And Vibration and Journal of Control and SHM.

M. Doehler was reviewer for Automatica, International Journal of Control, International Journal of Systems Science, Mechanical Systems and Signal Processing, Journal of Sound and Vibration, Mathematical Problems in Engineering, Smart Materials and Structures, Journal of Intelligent Material Systems and Structures

J. Dumoulin was reviewer for IEEE Transactions on Instrumentation and Measurement, Quantitative Infrared Thermography Journal, Optics and Lasers in Engineering journal , Journal Cultural Heritage, International Journal of Architectural Heritage, Journal of Geophysics and Engineering, Research in Nondestructive Evaluation

10.1.3. Invited Talks

J. Dumoulin was invited speaker at the 4th Youth in Conservation of Cultural heritage YOCOCU 2016, 21-23 September 2016, Madrid, Spain.

J. Dumoulin was invited keynote speaker at ERICE in October 2016.

J. Dumoulin was invited speaker at SFT 2016 in March 2016.

M. Mogoro (from SNCF) and V. Le Cam have been invited to give a keynote at the first SHM Conference dedicated to Railway in Qingdao, China, on October 2016 <http://www.crrgc.cc/iwshm-rs/english/>.

V. Le Cam have was invited speaker at the "NDT Conference organized by Airbus Group at Pondichery, India, January 2016"

10.1.4. Scientific Expertise

10.1.4.1. Method and device for localizing faults in an electrical cable

Participants: Nassif Berrabah, Qinghua Zhang.

In modern engineering systems, fault diagnosis is frequently an integrated functionality for various components, but rarely for electrical cables. The fast development of electronic devices is accompanied by more and more connecting cables. The reliability of electrical connections becomes a crucial issue because of their large number. Moreover, some cables are operated under severe conditions, such as extreme temperature, nuclear radiation, humidity, mechanical strain, etc.. Based on the work reported in Section 7.5.1 , a patent has been registered at INPI jointly by EDF and Inria [46]. It is about a method for detecting, localizing and quantifying resistive faults in a cable, by means of estimating the series resistance per unit length distributed along the cable from reflectometry measurements made at the ends of the cable. Its fast numerical computation makes it suitable for real time applications.

10.1.4.2. Scientific Expertise in European Calls

Participant: Vincent Le Cam.

V. Le Cam : Expertise of a specific EUROPEAN SME project in the call EUROSTARS.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Licence Professionnelle TAM : J. Dumoulin, thermographie infrarouge active, 16h, Université Paris-Est, France

Master 2 MMMRI, (Maintenance et Maîtrise des Risques Industriels) , J. Dumoulin, contrôle non destructif par thermographie infrarouge active, 12h, Université Paris-Est, France

Master 2 ITII, J. Dumoulin, , BTP, module Maintenance et réhabilitation des ouvrages, « Transferts thermiques dans les Structures : Des principes physiques à l'application sur site réel », 12 h, Ecole Centrale de Nantes(ECN).

Master Système Communicant Mobile, V. Le Cam, embedded systems under Linux Operating System, 12h, Polytech Nantes, France

Master Civil engineering, V. Le Cam, Structural Monitoring, 4h, Université de Nantes, France

Licence 3 SEICOM, V. Le Cam, 3h, SHM and smart grids, Université de Nantes, France

Licence 3 SEICOM, V. Le Cam, 8h, TP, SHM and smart grids, Université de Nantes, France

ESEO, V. Le Cam, 16h, TP, embedded systems under Linux Operating System, France

Polytech, V. Le Cam, 14h, TP, embedded systems under Linux Operating System, France

Master 1 informatique, M. Doehler, 24 TD projet recherche, Université de Rennes 1 & ENS Rennes, France

Licence Pro Mesures physiques, X. Chapeleau, Mesures optiques, 15h, IUT de St Nazaire, Université de Nantes, France

10.2.2. Supervision

PhD : Antoine Bassil, *Fibre-optic sensor for fatigue monitoring*, D. Leduc, O. Abraham and X. Chapeleau, Ecole doctorale SPIGA, Université de Nantes, since November 2016.

PhD : Delwar Hossain Bhuyan, *Damage localisation on offshore platforms*, L. Mevel and M. Doehler, Ecole doctorale MATISSE, Université de Rennes 1, since November 2014

Guillaume Gautier's post-doctoral project on morphosense system monitoring, L. Mevel, 2015-2017.

PhD : Nassif Berrabah, *Electrical cable ageing monitoring*, Q. Zhang, Ecole doctorale MATISSE, Université de Rennes 1, since November 2014

PhD : Nicolas Le Touz. *Design and study of positive energy transport infrastructures: from thermomechanical modeling to the optimization of such energy systems* J. Dumoulin. at Ecole Centrale Nantes (ECN) since 2015.

PhD : Thibault Toullier. *Simultaneous characterization of the radiative properties and temperatures of envelopes of structures in natural environment by multispectral infrared thermography* L. Mevel, J. Dumoulin and M. Doehler. Ecole doctorale MATISSE, Université de Rennes 1, since November 2016.

PhD : Saeid Allahdadian, *Methods for vibration-based damage assessment*, M. Doehler, University of British Columbia, Canada, since 2015.

PhD : Eva Viefhues, *Statistical damage localization for civil structures*, L. Mevel and M. Doehler, Ecole doctorale MATISSE, Université de Rennes 1, since November 2016.

J. Dumoulin is associate professor at Laval University, Canada.

M. Doehler is associate researcher at BAM, Germany.

10.3. Popularization

J. Dumoulin was in charge of hybrid/solar road that was demonstrated at COP21 and COP22.

MCTAO Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

The cut locus: A bridge over differential geometry, optimal control and transport, Bangkok, August 2016 (B. Bonnard, J.-B. Caillau, K. Kondo, L. Rifford, M. Tanaka). The conference was organized with the support of the Thai KMITL University and gathered 30 people mostly from Japan, Thailand and France.

9.1.1.2. Member of the Organizing Committees

Séminaire de géométrie hamiltonienne, Paris 6 (J.-B. Caillau). Bi-mensual seminar.

Journée McTAO, Inria Sophia, January 2016. One day event organized by the team with four invited speakers.

10th International Young Researcher Workshop on Geometry, Mechanics and Control, Paris (IHP), January 2016 (J.-B. Caillau). The workshop gathered 50 people for conferences and mini-courses.

Journées SMAI-MODE, Toulouse, March 2016 (J.-B. Caillau). The conference gathered 140 researchers, and was coupled with a series of two mini-courses co-organized with **GdR MOA**.

Journée MokaTAO, Inria Paris, October 2016. Two-day event co-organized by Mokaplan (Inria Paris) and McTAO teams, with talks by members of these teams. The two teams share common interests in optimization and optimal transportation.

Groupe de travail "Optimisation et applications", Inria Sophia Antipolis, November 2016 (J.-B. Caillau). One day event with four invited speakers.

9.1.2. Books

9.1.2.1. Springer briefs

B. Bonnard and J. Rouot, together with M. Chyba, have written the series of notes [28], submitted as Springer briefs Publications. They were the basis of courses at the Phd level given at the University of Burgundy and at the institute of Mathematics for industry at Fukuoka (Japan)

9.1.2.2. Springer Maths and Industry

B. Bonnard, together with M. Chyba, served as an editor of the volume [18], which gather contributions on the subject by specialists of both academics and space agencies.

9.1.2.3. Radon Series on Comput. and Applied Math.

J.-B. Caillau, together with M. Bergounioux, G. Peyré, C. Schnörr and T. Haberkorn, served as an editor for the volume [21]. With a focus on the interplay between mathematics and applications of imaging, the first part covers topics from optimization, inverse problems and shape spaces to computer vision and computational anatomy. The second part is geared towards geometric control and related topics, including Riemannian geometry, celestial mechanics and quantum control.

9.1.3. Journals

9.1.3.1. Member of the Editorial Boards

L. Rifford has been a member of the Editorial Board of the journal "Discrete and Continuous Dynamical Systems - A" since 2014.

9.1.3.2. Reviewer - Reviewing Activities

The team members have reviewed articles in 2016 for the following journals: SIAM J. Control & Optim., ESAIM Control Optim. and Calc. Var., Automatica, J. Dyn. Control Syst., J. Optim. Theory Appl., J. Math. Pures Appl., Inventiones Mathematicae, Mathematische Zeitschrift, Advances in Differential Equations, Memoirs of the American Mathematical Society, Annales Scientifiques de l'ENS, Nonlinear Analysis, Communications in Mathematical Physics

9.1.4. Invited Talks

J.-B. Caillau

03/2016: *Séminaire Géométrie et dynamique*, Nice

04/2016: *Séminaire de Géométrie hamiltonienne*, Paris

05/2016: *Emerging Trends in Applied Mathematics and Mechanics*, Perpignan

06/2016: *Alicante-Limoges-Elche Meeting on Optimization*, Cartagena

08/2016: *The cut locus: A bridge over differential geometry, optimal control and transport*, Bangkok

09/2016: *Séminaire Astrogéo*, Observatoire de la côte d'azur, Sophia

L. Giraldi

11/2016: *Controllability and hysteresis*, Trento, Italie

L. Rifford

02/2016: *Rencontre d'Analyse Mathématique et ses Applications*, Ouargla (Algeria)

02/2016: *Séminaire de Calculs des Variations et EDP*, Aix-Marseille University

03/2016: *CIMPA Research School "Géométrie et Analyse"*, Abidjan (Ivory Coast)

03/2016: *Séminaire Bourbaki*, Institut Henri Poincaré, Paris

04/2016: *Colloquium de l'Institut de Mathématiques*, University of Neuchâtel (Switzerland)

04/2016: *International Conference of the GE2MI*, Hammamet (Tunisia)

05/2016: *Colloquium du Département de Mathématiques*, University of Orsay

05/2016: *Geometric control and sub-Riemannian geometry*, Course given at the University of Isfahan (Iran)

06/2016: *Analysis, Geometry, and Optimal Transport*, KIAS, Seoul (South Korea)

08/2016: *The cut locus*, KIMTL, Bangkok (Thailand)

11/2016: *Dynamical Systems Seminar*, ETH Zurich

11/2016: *Dynamics and Geometry Seminar*, University Nice Sophia Antipolis

12/2016: *Seminar of Hamiltonian Geometry*, Paris VI

12/2016: *2016 Analysis School in Benin*, IMPS, Benin

9.1.5. Leadership within the Scientific Community

J.-B. Caillau has been head of the **SMAI-MODE** group (2014-2016), the group on optimization of the French Society for Applied and Industrial Mathematics.

L. Rifford has been executive director of CIMPA since September 2016.

9.1.6. Scientific Expertise

J.-B. Caillau is member of the scientific committees of the “**Institut de Mécanique Céleste de Calcul des Éphémérides**” and of the **GdR Calcul**, and corresponding member in Dijon for the Labex **AMIES**.

J.-B. Pomet is a member of the steering committee of “C4PO”, a structuring project of the IDEX UCA^{JEDI}.

9.1.7. Research Administration

J.-B. Caillau is the joint head of the CNRS team **Statistique, Probabilités, Optimisation & Contrôle** at the Math. Institute of Univ. Bourgogne & Franche-Comté.

J.-B. Pomet has been an elected member of the Inria Evaluation Committee (commission d'évaluation) since 2014.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

J.-B. Caillaud has managed L1 math and the master of applied mathematics (M2 **MIGS**) of Univ. Bourgogne Franche-Comté (2014-2016). He has been a designated member of the Conseil pédagogique du Département de Mathématiques at UBFC (2014-2016), and of the Conseil de l'UFR Mathématiques & Informatique at Univ. Paris I (2014-2016). His teaching duties in 2016 include:

Licence : cours d'analyse (analysis), 100 H équivalent TD, niveau L1, Univ. Bourgogne Franche-Comté, France

Master : approximation géométrique (geometric approximation), 50 H équivalent TD, niveau M1, Univ. Bourgogne Franche-Comté, France

Master : optimisation, 50 H équivalent TD, niveau M2, Univ. Bourgogne Franche-Comté, France

Master : contrôle optimal (optimal control), 20 H équivalent TD, niveau M2, ENSTA-Paristech, France

L. Giraldi is responsible of the following courses:

Licence : “*colles de mathématiques*”, *MPSI and MP*, 4 H équivalent TD/week, L1 L2, Lycée International de Valbonne,

Licence : numerical analysis, 20 H équivalent TD, L3, Polytech Nice Sophia,

Master : numerical analysis project, 30 H équivalent TD, M1, Polytech Nice Sophia.

9.2.2. Supervision

PhD: Zheng Chen, L^1 -minimization in space mechanics, Univ. Paris Saclay, defended September, 2016, J.-B. Caillaud (co-supervised with Y. Chitour) [1]

PhD: Jérémy Rouot, , Univ. Nice Sophia Antipolis, Geometric and numerical methods in optimal control and application to orbit transfer and swimming at low Reynolds number. Defended November, 2016, co-supervised by B. Bonnard and J.-B. Pomet. [2]

PhD in progress: Achille Sassi, to be defended 01/2017, Numerical methods for hybrid control and chance-constrained optimization problems, Univ. Paris Saclay, J.-B. Caillaud (co-supervised with M. Cerf, E. Trélat and H. Zidani)

PhD in progress: Michaël Orioux, started 10/2015, Dynamical systems and optimal control, Univ. Paris Dauphine, J.-B. Caillaud (co-supervised with J. Féjóz)

PhD in progress: Zeinab Badreddine, started 09/2014, Sub-Riemannian Geometry and Optimal Transport, co-supervised by L. Rifford and B. Bonnard.

PhD in progress: Sébastien Fueyo, started 09/2016, Testing stability of nonlinear amplifier by frequency-domain methods. J.-B. Pomet (co-supervised with L. Baratchart).

PhD in progress: Alice Nolot, started 09/2016, Sub-Riemannian geometry and optimal swimming at low Reynolds number. B. Bonnard.

9.2.3. Juries

In 2016, J.-B. Caillaud referee for Jiamin Zhu (Univ. Paris 6) and Maxime Chupin (Univ. Paris 6) PhD theses, for the HDR of Aude Rondepierre (Univ. Toulouse), and jury member for the PhD thesis of Clément Royer (Univ. Toulouse).

9.3. Popularization

Conference for high school students, "Ne votez pas, jugez !" (J.-B. Caillaud), **semaine des maths 2016**, Lycée Charles de Gaulle (Dijon) and **MASTIC** initiative (Inria Sophia Antipolis).

NECS Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

C. Canudas de Wit has been appointed General Chair of the 58th IEEE Conference on Decision and Control, 2019.

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

P. Frasca has been Associate Editor-at-Large in the International Program Committee of the 55th IEEE Conference on Decision and Control, 2016.

P. Frasca and F. Garin are Associate Editors in the IEEE Control System Society Conference Editorial Board. This year, they served for the 2016 American Control Conference, the 2017 American Control Conference, and the 55th IEEE Conference on Decision and Control, 2016.

P. Frasca is Associate Editor in the European Control Association (EUCA) Conference Editorial Board. This year, he served for the 2016 European Control Conference.

P. Frasca has been appointed as Associate Editor in the IEEE Robotics and Automation Society CASE Conference Editorial Board: he shall serve for 13th IEEE International Conference on Automation Science and Engineering, 2017.

Hassen Fourati was a member of the International and Scientific Program Committees of the International Conference on Control, Automation and Diagnosis (ICCAD'17), 2017, and the International Conference on Sciences and Techniques of Automatic Control and Computer Engineering STA2016, 2016.

10.1.2.2. Reviewer

Team members, and in particular faculty, have been reviewers for several conferences (including the most prestigious ones in their research area): IEEE Conference on Decision and Control CDC, European Control Conference ECC, American Control Conference ACC, European Signal Processing Conference, IEEE International Conference on Robotics and Automation ICRA, IEEE/RSJ International Conference on Intelligent Robots and Systems IROS, IFAC Workshop on Distributed Estimation and Control in Networked Systems (NecSys), Indian Control Conference.

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

Carlos Canudas de Wit is Associate Editor of IEEE Transactions on Control of Networks Systems IEEE-TCNS (since June 2013), Associate Editor of IEEE Transactions on Control System Technology IEEE-TCST (since January 2013), and Editor of the Asian Journal of Control AJC (since 2010).

Paolo Frasca is Subject Editor of the International Journal of Robust and Nonlinear Control (Wiley) (since February 2014) and has been appointed as starting Associate Editor of IEEE Control System Letters (from February 2017).

Hassen Fourati is Associate Editor of the Asian Journal of Control AJC (since January 2016).

10.1.3.2. Reviewer - Reviewing Activities

Team members, and in particular faculty, have been reviewers for several journals (including the most prestigious ones in their research area): IEEE Trans. on Automatic Control, IEEE Trans. on Control of Network Systems, IEEE Trans. on Signal Processing, Automatica, IEEE Signal Processing Letters, Systems and Control Letters, IEEE Transactions on Information Theory, Elsevier Signal Processing, Int. Journal of Robust and Nonlinear Control, IET Communications, IET Wireless Sensor Networks. IEEE/ASME Trans. on Mechatronics, IEEE Trans. on Instrumentations and Measurements, IEEE Sensors journal, IEEE Trans. on Robotics, Networks and Heterogeneous Network (NHM), Mathematical Methods in the Applied Sciences (MMAS), Journal of Mathematical Analysis and Applications (JMMA), AMS Mathematical Reviews, Journal of Intelligent Transportation Systems.

10.1.4. Invited Talks

- C. Canudas de Wit, “Optimal Traffic Control: Eco-driving, Green-waves, Adaptive traffic lights” (plenary talk), Latin American Conference on Automatic Control 2016, Medellin, Colombia, October 2016.
- M. L. Delle Monache, “Some control strategies for conservation laws with applications to traffic flow”, Séminaire de théorie du contrôle de Toulon, University of Toulon, November 2016.
- P. Frasca, “Non-smooth and hybrid systems in opinion dynamics”, IEEE CDC satellite workshop on Dynamics and Control in Social Networks, Las Vegas, Nevada, December 2016.
- P. Frasca, “Non-smooth and hybrid systems in opinion dynamics”, ANR Workshop "Control subject to computational and communication constraints" (CO4), Toulouse, France, October 2016.

10.1.5. Leadership within the Scientific Community

C. Canudas de Wit has been president of the European Control Association (EUCA) until June 2015, and is now (until 2017) Past-president and member of the EUCA Council.

10.1.6. Scientific Expertise

Team members participate to the following technical committees of IEEE Control Systems Society and of the International Federation of Automatic Control:

CSS Technical Committee “Networks and Communications Systems” (P. Frasca and F. Garin);

IFAC Technical Committee 1.5 on Networked Systems (P. Frasca and C. Canudas de Wit);

IFAC Technical Committee 2.5 on Robust Control (P. Frasca);

IFAC-TC7.1 Automotive Control (C. Canudas de Wit);

IFAC-TC7.4 Transportation systems (C. Canudas de Wit).

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Master: F. Garin, Distributed Algorithms and Network Systems, 13.5h, M2, Univ. Grenoble Alpes, France.

Licence: H. Fourati, Informatique Industrielle, 105h, L1, IUT 1 (GEII), Univ. Grenoble Alpes, France;

Licence: H. Fourati, Réseaux locaux industriels, 50h, L1 et L2, IUT1 (GEII), Univ. Grenoble Alpes, France.

Licence: H. Fourati, Automatique, 61,5h, L3, UFR physique, Univ. Grenoble Alpes, France.

Licence: H. Fourati, Automatique échantillonnée, 15h, L2, IUT 1 (GEII), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Automatique, 52h, L2, IUT1(GEII1), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Mathématiques, 33h, L2, IUT1 (GEII1), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Mathématiques, 44h, L1, IUT1 (GEIII), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Automatique, 16h, L3, IUT1 (GEIII), Univ. Grenoble Alpes, France.

Doctorat: C. Canudas de Wit has organized the 37th International Summer School of Automatic Control Grenoble, France September, 12-16, 2016 on the topic “Advanced algorithms for traffic prediction and control”.

10.2.2. Supervision

PhD: Aida Makni, Inertial and magnetic data fusion for attitude estimation under energetic constraint for accelerated rigid body, Univ. Grenoble Alpes, March 2016, co-advised by H. Fourati, A. Kibangou and C. Canudas de Wit.

PhD in progress: Simon Gerwig, Collaborative, reconfigurable and resilient control for hydro-electric power-plants, from Feb. 2014 until Mar. 2017, co-advised by C. Canudas de Wit, F. Garin and B. Sari (Alstom).

PhD in progress: Pietro Grandinetti, Control of large-scale traffic networks, from Apr. 2014, co-advised by C. Canudas de Wit and F. Garin.

PhD in progress: Andrés Alberto Ladino Lopez, Robust estimation and prediction in large scale traffic networks, from Oct. 2014, co-advised by C. Canudas de Wit, A. Kibangou and H. Fourati.

PhD in progress: Thibaud Michel, Mobile Augmented Reality Applications for Smart Cities, from Nov. 2014, co-advised by N. Layaïda, H. Fourati and P. Geneves.

PhD in progress: Sebing Gracy, Cyber-physical systems: a control-theoretic approach to privacy and security, from Oct. 2015, co-advised by A. Kibangou and F. Garin.

PhD in progress: Stéphane Durand, Coupling distributed control and game theory: application to self-optimizing systems, from Oct. 2015, co-advised by B. Gaujal and F. Garin.

PhD in progress: Stéphane Mollier, Aggregated Scale-Free Models for 2-D Large-scale Traffic Systems, from Oct. 2016, co-advised by C. Canudas de Wit, M. L. Delle Monache and B. Seibold.

PhD in progress: Nicolas Martin, On-line partitioning algorithms for evolutionary scale-free networks, from Dec. 2016, co-advised by C. Canudas de Wit and P. Frasca.

10.2.3. Juries

- C. Canudas de Wit was committee member of the PhD defence of Kuo-Yun Liang, KTH Stockholm. Ph.D. advisor: K.H. Johansson, June 10, 2016.
- H. Fourati was committee member of the PhD defense of Christophe Combettes, Institut Français des Sciences et Technologies des Transports, de l'Aménagement et des Réseaux (IFSTTAR), Spécialité : Automatique et Informatique appliquée, October 17, 2016.
- P. Frasca was committee member of the PhD defence of Laura Dal Col, *On distributed control analysis and design for multi-agent systems subject to limited information*, Institut National des Sciences Appliquées, Toulouse, France. Ph.D. advisors: Luca Zaccarian and Sophie Tarbouriech, October 25, 2016.
- H. Fourati was committee member of “Qualification Maître de Conférences 2016” during January 2016, Autrans, France.

10.3. Popularization

The GTL webpage (<http://gtl.inrialpes.fr/status>) went public in November: more generally the traffic activities have been popularized via the following public talks.

- M. L. Delle Monache. DEMO on the GTL at the “Journées des nouveaux arrivants”, Inria, Paris, Dec. 2016
- M. L. Delle Monache, Traffic flow modeling, GIPSA-Lab days, Grenoble, Nov. 2016

NON-A Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

- W. Perruquetti is the chairman of the IFAC Technical Committee “Social Impact of Automation”, International Federation of Automatic Control, TC 9.2, and a member of the IFAC Technical Committees “Nonlinear Control Systems”, TC 2.3, and “Discrete Event and Hybrid Systems”, TC 1.3.
- A. Quadrat is a member of the IFAC Technical Committee “Linear Control Systems”, International Federation of Automatic Control, TC2.2
- J.-P. Richard is a member of the IFAC Technical Committee “Linear Control Systems”, International Federation of Automatic Control, TC2.2
- G. Zheng is a member of the IFAC Technical Committee “Social Impact of Automation”, International Federation of Automatic Control, TC9.2
- G. Zheng is co-chair of the working group “Commande et pilotage en environnement incertain” of GRAISYHM

10.1.1.2. Member of the Organizing Committees

C. Jamroz, A. Quadrat, J.-P. Richard and G. Zheng were members of the organizing committee of “JAMACS’16 : Journées Automatique du GDR MACS 2016”, Villeneuve d’Ascq, 15-16/11/2016.

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

W. Perruquetti is a member of the steering committee of IFAC CPHS’16 (7-9 December 2016, Florianopolis, Brazil), an IPC member of IEEE VSS’16 (1-4 June 2016, Nanjing, Jiangsu, China) and of IFAC HMS’16 (August 30-September 2 2016, Kyoto, Japan) and an Associate Editor of the 20th IFAC World Congress (10-14 July 2017, Toulouse, France).

W. Perruquetti and J.-P. Richard are members of the Advisory panel (NOC) of 20th IFAC World Congress, Toulouse, France, 10-14 July 2017.

10.1.2.2. Reviewer

The members of NON-A team are reviewers and contributors of all top-ranked conferences in the field of automatic control (IEEE Conference on Decision and Control, IFAC World Congress, European Control Conference, American Control Conference, etc.).

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- A. Polyakov: International Journal of Robust and Nonlinear Control
- A. Polyakov: Journal of Optimization Theory and Applications (JOTA)
- A. Polyakov: Automation and Remote Control
- A. Quadrat: Multidimensional Systems and Signal Processing (MSSP)

10.1.3.2. Reviewer - Reviewing Activities

The members of NON-A team are reviewers of all top-ranked journals in the field of automatic control (IEEE Transactions on Automatic Control, Automatica, SIAM Journal of Control and Optimization, International Journal of Robust and Nonlinear Control, etc.).

10.1.4. Invited Talks

D. Efimov gave a plenary talk at the conference “JAMACS’16 : Journées Automatique du GDR MACS 2016”, Villeneuve d’Ascq, France, 15-16/11/2016.

10.1.5. Leadership within the Scientific Community

The NON-A team is the leader in the field of non-asymptotic control and estimation using homogeneity framework.

Moreover, the NON-A team is also leader in algebraic systems theory. In particular, two invited sessions “Algebraic methods and symbolic-numeric computation in systems theory” were organized at the 22nd International Symposium on Mathematical Theory of Networks and Systems (MTNS 2016), University of Minnesota, USA, 12-15/07/2016. Moreover, a mini-workshop “New trends on multidimensional systems and their applications in control theory and signal processing” was organized at Centre International de Rencontres Mathématiques (CIRM), Luminy, France, 03-07/10/2016.

10.1.6. Scientific Expertise

A. Quadrat was a member of the “jury d’admission des concours Inria CR2 & CR1”. He was also a member of the “Commission des Emplois de Recherche”, Inria Lille, and a member of the “Autorité de déchiffrement” for the local elections.

10.1.7. Research Administration

- W. Perruquetti is Vice-deputy of INS2I CNRS.
- J.-P. Richard is an Expert for the French Ministry of Research, MENESR/MEIRIES.
- R. Ushirobira was a Member (nominated) of the “Comité du Centre” of Inria Lille (Dec. 2013 - Sept. 2016) and a Member of the “Commission de Développement Technologique” (CDT).

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Licence: D. Efimov, Laboratory works in automatics, 20 h, EC de Lille.

Licence: D. Efimov, Practical works in automatics, 28 h, ISEN, Lille.

Licence: D. Efimov, Laboratory works in discrete systems, 20 h, ENSAM, Lille.

Licence: R. Ushirobira, Travaux Pratiques en Automatique, 8 h, U. Lille 1, France.

Licence: R. Ushirobira, Travaux Pratiques en Automatique, 24 h, EC-Lille, France.

Licence: R. Ushirobira, Travaux dirigés/Travaux Pratiques en Automatique, 12 h+9 h, U. Lille 1.

Master: D. Efimov, Analysis of dynamical systems, 24 h, U. Lille 1.

Master: R. Ushirobira, Travaux Pratiques en Automatique, 32 h, U. Lille 1.

Master: G. Zheng, Robotic, 20 h, U. Lille 1.

Master: G. Zheng, Automatic control, 24 h, U. Lille 1.

10.2.2. Supervision

PhD: Hafiz Ahmed, “Modeling and synchronization of biological rhythms: from cells to oyster behavior”, 2013-2016, supervisors: D. Efimov, R. Ushirobira and D. Tran

PhD: Zilong Shao, “Oscillatory control of robot manipulator”, EC Lille, 2012-2016, supervisors: D. Efimov, W. Perruquetti, G. Zheng

PhD in progress: Haik Jan Davtjan, “Estimation in complex systems”, EC Lille, 2016, UCoCoS EU project, supervisors: D. Efimov, J.-P. Richard

PhD in progress: Maxime Feingesicht, “Dynamic Observers for Control of Separated Flows”, Ecole Centrale de Lille, 2015, supervisors: J.-P. Richard, F. Kerherve, A. Polyakov

PhD in progress: Nadhynee Martinez Fonseca, “Non-asymptotic control and estimation problems in robotic system designed for manipulation of micro-organisms”, National Polytechnic Institute of Mexico, 2015-now, supervisors: I. Chairez-Oria, A. Polyakov

PhD in progress: Tatiana Kharkovskaya, “Interval Observers for Distributed Parametr Systems”, ITMO University-EC Lille, 2015, supervisors: D. Efimov, J.-P. Richard and A. Kremlev

PhD in progress: Langueh Désiré Kokou, “Inversion a gauche, singularités d’inversion, immersion et formes normales pour les systèmes dynamiques”, 2015, supervisors: T. Floquet, G. Zheng

PhD in progress: Gabriele Perozzi, “Save exploration of aerodynamic field by microdron”, Onera-Region, 2015, supervisors: D. Efimov, J.-M. Biannic and L. Planckaert

PhD in progress: Francisco Lopez-Ramirez, “Control and estimation via implicit homogeneous Lyapunov function”, Inria, 2015, supervisors: D. Efimov, W. Perruquetti and A. Polyakov

PhD in progress: Guillaume Rance, “Asservissement paramétrique de systèmes flexibles à retard et application aux viseurs”, CIFRE Safran Electronics & Defense, 2014, supervisors: A. Quadrat, A. Quadrat, H. Mounier

PhD in progress: Haik-Jan Silm, “Estimation in complex systems”, 2016, supervisors: D. Efimov, R. Ushirobira, W. Michels, J.-P. Richard

PhD in progress: Yue Wang, “Development of a blimp robot for indoor operation”, EC Lille, 2016, supervisors: D. Efimov, W. Perruquetti, G. Zheng

Master: Boussad Abci, EC Lille, 2015-2016, supervisors: D. Efimov, J.-P. Richard

Master: Rabehi Djahid, EC Lille, 2015-2016, supervisors: D. Efimov, J.-P. Richard

10.2.3. Juries

- A. Quadrat was an Examiner Member of the PhD Thesis of Mohamed Belhocine, “Modélisation et analyse structurelle du fonctionnement dynamique des systèmes électriques”, ENS Cachan. He was also a Member of Recruiting Committee for a MCF CNU 26-27 position at the University of Limoges.
- J.-P. Richard was an Examiner Member of the PhD Thesis of Arvo Kaldmae (Estonia), “Design of discrete-time and delayed nonlinear systems”, of Lucien Etienne (Italy), “Elements of observation and estimation for networked control systems”, and of Zilong Shao (Centrale Lille) “Identification and control of position-controlled robot arm in the presence of joint flexibility”.
- R. Ushirobira was a Member of Recruiting Committee for a MCF CNU 61 position at CNAM (Paris) and for a MCF CNU 61 position at ENSAE (Cergy).

10.3. Popularization

- Mediation: Scientific baccalaureate students. Meeting on the Inria platform EuraTechnologies (23/03/2016, Lille): “SN Lille Académie : À la découverte des sciences numériques !”.
- Mediation: BeyondLab community. A co-working night event within BeyondLabon using “Living sensor” for water quality monitoring, featuring our PhD student Hafiz Ahmed (Lille, 16/03/2016).
- Contribution to the prospective report “Systems & Control for the Future of Humanity” coordinated by F. Lamnabhi-Lagarrigue, Research Agenda Task Force (to appear, special issue of Annual Reviews in Control to be distributed during the IFAC 2017).
- The book “Mathématiques pour l’ingénieur” (2009, ISBN : 978-9973-0-0852-7 (ATAN, 385 pages)) has been downloaded more than 65000 times.

QUANTIC Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Journal

8.1.1.1. Member of the Editorial Boards

Mazyar Mirrahimi is an associate editor of System and Control Letters.

Mazyar Mirrahimi is a guest editor for the journal "Quantum Science and Technology" (Institute Of Physics, 2016), Special number on "Quantum coherent feedback and quantum reservoir engineering".

8.1.1.2. Reviewer - Reviewing Activities

Benjamin Huard served as a referee for Nature, Science, Physical Review Letters and other physics journals.

Zaki Leghtas served as a referee for Physical Review Letters and Physical Review X.

Mazyar Mirrahimi served as a referee for Nature and Physical Review Journals.

Pierre Rouchon has been a reviewer for several automatic control and dynamical systems journals and conferences.

Alain Sarlette has been a reviewer for several automatic control and dynamical systems journals and conferences.

8.1.2. Invited Talks

Benjamin Huard, Aug 2016 Formulating and Finding Higher-Order Interference Workshop, Perimeter Institute, Canada.

Benjamin Huard, Jun 2016 4th International Workshop on Frontiers in Quantum Optics and Quantum Information, Beijing Computational Research Center, Beijing, China.

Benjamin Huard, May 2016 Physics department seminar, Chalmers University, Sweden.

Benjamin Huard, May 2016 Statistical Mechanics of Quantum Dynamics, Mariehamn, Finland.

Benjamin Huard, May 2016 Workshop Non-equilibrium thermodynamic phenomena and problems of mesoscopic physics, Aalto University, Finland.

Benjamin Huard, Mar 2016 Mini-Colloque "Rencontre du Non Linéaire" 2016, Paris, France.

Benjamin Huard, Jan 2016 Conference SCALEQIT 2016, Delft, Netherlands.

Zaki Leghtas, Oct 2016, Karlsruhe Institute of Technology, Germany.

Mazyar Mirrahimi, Dec 2016, Yale University, USA.

Mazyar Mirrahimi, Dec 2016, Tutorial at Conference GDR Physique Mesoscopique, Aussois, France.

Mazyar Mirrahimi, Nov 2016, UC Berkeley, USA.

Mazyar Mirrahimi, Oct 2016, University of Pennsylvania, USA.

Mazyar Mirrahimi, June 2016, Journées Scientifiques Inria, Inria Rennes, France.

Mazyar Mirrahimi, July 2016, Tutorial in summer school "Stochastic Methods in Quantum Mechanics", Autrans, France.

Mazyar Mirrahimi, April 2016, "Quantum and Nano Control" workshop, Institute of Mathematics and its Applications of Minneapolis, USA.

Mazyar Mirrahimi, Feb 2016, Institut Néel, Grenoble, France.

Mazyar Mirrahimi, Jan 2016, Conference SCALEQIT 2016, Delft, Netherlands.

Pierre Rouchon, Dec 2016, IEEE Conference on Decision and Control, Las Vegas, USA.

Pierre Rouchon, April 2016, "Quantum and Nano Control" workshop, Institute of Mathematics and its Applications of Minneapolis, USA.

Pierre Rouchon, June 2016, Conference "Nonlinear Partial Differential Equations and Applications" in the honor of Jean-Michel Coron for his 60th birthday, IHP, Paris.

Alain Sarlette, May 2016, workshop on quantum dynamics and control, IHP, Paris.

Alain Sarlette, July 2016, summer school "Stochastic Methods in Quantum Mechanics", Autrans, France.

8.1.3. Scientific Expertise

Benjamin Huard was a member of the ANR CES30 committee in 2016.

Mazyar Mirrahimi is a member of the Technical Committee on "Distributed Parameter Systems" in IFAC (International Federation of Automatic Control).

Pierre Rouchon was "président du comité d'experts" for the HCERES evaluation in January 2016 of the "Laboratoire des Sciences du numériques de Nantes (LS2N)" .

Pierre Rouchon acts as panel member for the panel PE1-Mathematics in the ERC Advanced Grant 2016 evaluation.

Pierre Rouchon is a member of the "Conseil Scientifique du Conservatoire National des Arts et Metiers" since 2014.

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

Benjamin Huard has given a course (20 hours) entitled "Quantum fluctuations and measurement" in the Master ICFP (International Centre for Fundamental Physics) of ENS Paris, UPMC, Paris 7 and Orsay.

Benjamin Huard has coordinated an experimental project (40 hours) entitled "Measuring the quantum of conductance across an atom" at ENS Paris for Physics students in L3.

Zaki Leghtas taught a course on Quantum Mechanics at Paris Sciences et Lettres (40 hours).

Zaki Leghtas taught a course on Quantum Mechanics and Statistical Physics at Mines ParisTech (12 hours).

Zaki Leghtas taught a course on Complex Analysis at Mines ParisTech (10 hours).

Mazyar Mirrahimi and Pierre Rouchon have given a course (20 hours) entitled "UE : Analyse et contrôle de systèmes quantiques " in the "Master de sciences et technologies, mention mathématiques et applications, Université Pierre et Marie Curie".

Mazyar Mirrahimi has given a graduate-level course (15 hours) entitled "Quantum Control" at Yale University.

Mazyar Mirrahimi has given a 4-hour tutorial on "Quantum measurement and feedback" at the summer school "Stochastic Methods in Quantum Mechanics", Autrans, France.

Pierre Rouchon and Alain Sarlette gave a one week half-time course (15hours) on feedback control of quantum systems at the Elgersburg schools for Mathematical System Theory, 29/2/2016 - 4/3/2016, Germany.

Alain Sarlette has given a master course on "Probabilistic robotics" at Ghent University (30 hours).

8.2.2. Supervision

PhD in progress: Danijela Markovic, ENS. "Quantum information protocols with microwave quantum optics". Sept 2014. (advisors: Benjamin Huard and François Mallet).

PhD in progress: Nathanaël Cottet, ENS. "Quantum heat engines based on superconducting circuits". Sept 2015. (advisor: Benjamin Huard).

PhD in progress: Quentin Ficheux, ENS. "Thermodynamics of quantum information". Sept 2015. (advisors: Benjamin Huard and Zaki Leghtas).

PhD in progress: Raphael Lescanne, ENS. "Engineering Multi-Photon Dissipation In Superconducting Circuits For Quantum Error Correction". September 2016. (advisors: Zaki Leghtas and Benjamin Huard).

PhD in progress: Rémi Azouit, Mines Paristech. "Quantum circuits, Input/Output theory and adiabatic elimination". Sept 2014. (advisor: Pierre Rouchon).

PhD in progress: Gerardo Cardona, Mines ParisTech. "Beyond static gains in analog quantum feedback control". Nov 2016 (advisors: Pierre Rouchon and Alain Sarlette).

PhD in progress: Alain Sarlette is co-supervising 3 PhD students with his former institution UGent (Simon Apers, Zhifei Zhang, Arash Farnam). Simon Apers is working on (quantum) network algorithms accelerations and intends to address other quantum control questions.

PhD: Joachim Cohen, ENS. "Autonomous quantum error correction with superconducting circuits". Nov 2013 (advisor: Mazyar Mirrahimi), His defense is programmed for Feb 2017.

PhD in progress: Lucas Verney, ENS. "Robust quantum information processing with superconducting circuits". Sept 2016. (advisors: Zaki Leghtas and Mazyar Mirrahimi).

PhD: Noad Hamze El Badaoui. He has defended his PhD thesis on December 2, 2016. His thesis entitled "Dynamique et estimation paramétrique pour les gyroscopes laser à milieu amplificateur gazeux" was under the supervision of Philippe Martin and Pierre Rouchon.

PhD: Pierre Six. He has defended his PhD thesis on November 22, 2016. His thesis entitled "Estimation d'état et de paramètres pour les systèmes quantiques ouverts" was under the supervision of Pierre Rouchon.

8.2.3. *Juries*

Benjamin Huard was a member of the PhD defense committees of Katrina Sliwa (Yale University, USA), Antoine Tilloy (ENS Paris, France), Philip Krantz (Chalmers, Sweden), Kristinn Juliusson (CEA Saclay, France), Yehan Liu (Yale University, USA), Pierre Six (Mines ParisTech, France) and of the HdR committee of Caglar Girit (Collège de France, France).

Mazyar Mirrahimi was a member the PhD defense committees of Zhan Shi (Reviewer, University of New South Wales, Australia), Shakib Daryanoush (Reviewer, University of Griffith, Australia), Ying Fu (Reviewer, Université Paris Dauphine), Kristinn Juliusson (CEA Saclay, France).

Alain Sarlette was a member of the PhD defense committee of Bram Vervisch (Ghent University, Belgium).

8.3. Popularization

Mazyar Mirrahimi gave interviews for radios, newspapers, magazines and websites (France Culture, Le Monde, La Recherche, Silicon, Industrie and Technologies).

Pierre Rouchon was invited by the "Département de Mathématiques Appliquées de l'École Polytechnique" to give a talk entitled "Dynamique et contrôle des systèmes: du classique au quantique" for the students of Ecole Polytechnique (April 21, 2016).

Alain Sarlette is answering questions about quantum control and quantum computing on the website "ik-heb-een-vraag.be" where Flemish layman can ask questions to scientific experts.

SPHINX Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General chair, scientific chair

Xavier Antoine was a member of the scientific committee of Waves 2017, University of Minneapolis, USA.

10.1.1.2. Member of the Organizing Committees

Several members of the team were involved in the organization of the 43rd national conference CANUM 2016 (<http://smai.emath.fr/canum2016/>). In particular, Karim Ramdani was the head of the Organizing Committee.

Xavier Antoine was co-organizer of Colloque Couplages numériques, hold in September 27-29, 2016, in Nice, France. <http://math.unice.fr/~massonr/CouplagesNumeriques/index.php>

Julie Valein organized a day Fédération Charles Hermite "Estimation for dynamical systems" (06/10/2016)

10.1.2. Scientific Events Selection

10.1.2.1. Reviewer

Thomas Chambrion is a reviewer for the American Control Conference and the Conference on Decision and Control.

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

Jean-Claude Vivalda is a member of the editorial board of the *Journal of Dynamical and Control Systems*.

10.1.3.2. Reviewer - Reviewing Activities

Most of the members of our team are regular reviewer for major publications in the field of control.

- Thomas Chambrion is a reviewer for SICON, IEEE TAC, Automatica, International Journal of Control, MCMS.
- Julie Valein is a reviewer for SICON, ESAIM COCV.
- Jean-Claude Vivalda is a reviewer for SICON and for the Mathematical Reviews.

10.1.4. Invited Talks

Julie Valein was invited to

- LMV seminar, Versailles, 14 janvier 2016
- Mathematics-Automatic meeting, IECL – CRAN, Nancy, 28 June, 2016
- Conference « Stability of non-conservative systems », Valenciennes, 4-7 July 2016

Xavier Antoine was invited to

- Seminar, Bale University, December 2016.
- Seminar, Beijing University, July 2016.

10.1.5. Scientific Expertise

Julie Valein was a member of several "Comité de selection":

- for an associate professor position at École des Mines de Nancy;
- for an associate professor position at Université Lyon 1;
- for a teaching position at École des Sciences et Techniques de l'Ingénieur de Nancy.

Thomas Chambrion belongs to the selection panel for the Natural Sciences and Engineering Research Council of Canada.

10.1.6. Research Administration

- Xavier Antoine has been head of IECL since September 2015.
- David Dos Santos has been head of IECL PDE team since September 2014.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Most of the members of the team have a teaching position at Université de Lorraine.

Xavier Antoine teaches at Mines Nancy and ENSEM (Université de Lorraine), L3-M1, 96 hours.

Thomas Chambrion teaches at ESSTIN (Université de Lorraine), L1-L2, 192 hours.

David Dos Santos Ferreira teaches at UFR STMIA (Université de Lorraine), 192 hours.

Alexandre Munnier teaches at UFR STMIA (Université de Lorraine), 192 hours.

Jean-François Scheid teaches at Telecom Nancy (Université de Lorraine), 192 hours.

Julie Valein teaches at ESSTIN (Université de Lorraine), L1-L2, 192 hours.

10.2.2. Supervision

PhD in progress : Boris Caudron, CIFRE thesis with Thales, Coupling between integral equations/finite element for the numerical solution by domain decomposition methods of wave scattering problems, since June 2015, Xavier Antoine and Christophe Guezaine.

PhD in progress : Alessandro Duca, controllability of bilinear Schrödinger equations, since September 2015, Nabile Boussaïd and Thomas Chambrion.

10.2.3. Juries

Xavier Antoine was a referee for the Ph.D. thesis of P. Rammaciotti Morales (Ecole Polytechnique), and Marc Bakry (ENSTA).

Thomas Chambrion was referee of the PhD thesis of Leo Van Damme (Université de Bourgogne).

10.3. Popularization

Karim Ramdani has given several talks at Université de Lorraine to raise researchers awareness on the risks of author-pays publication model (for more information on economic models of scientific publishing, see http://iecl.univ-lorraine.fr/~Karim.Ramdani/KR_BIB/AUTEURS.html).

Thomas Chambrion gave a presentation of applied mathematics at Lycée Poincaré (Nancy) in April 2016.

TROPICAL Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

- S. Gaubert co-organized, jointly with D. Grigoriev (CNRS, Lille), M. Joswig (TU Berlin) and T. Theobald (Frankfurt), a Dagstuhl workshop, on “Effectivity in tropical mathematics, and beyond”.

10.1.1.2. Member of the Organizing Committees

- M. Akian co-organized a workshop on hybrid systems, IHP, 2016.
- S. Gaubert co-organizes the “Séminaire Parisien d’Optimisation”.
- S. Gaubert, co-organized with S. Charousset (EDF) the PGMO days at EDF labs Paris-Saclay.
- X. Allamigeon co-organized two invited sessions on semidefinite programming and tropical methods at the conference PGMO Days.

10.1.2. Scientific Events Selection

10.1.2.1. Chair of Conference Program Committees

- S. Gaubert, president of the scientific committee of SMAI-MODE 2016 (Toulouse, March 2016).

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- S. Gaubert is member of the editorial committee of the collection Mathématiques et Applications, SMAI and Springer.
- S. Gaubert is associate editor of Linear and Multilinear Algebra.
- S. Gaubert is associate editor of RAIRO Operations research.

10.1.4. Invited Talks

- M. Akian, Keynote lecture at ETAMM 2016.
- S. Gaubert, invited lecture at the 2016 Conference on Applied Mathematics, Hong Kong University.

10.1.5. Leadership within the Scientific Community

- S. Gaubert coordinates the Gaspard Monge Programme for Optimization and Operations Research (PGMO), a corporate sponsorship of EDF operated by Fondation Mathématique Jacques Hadamard at Paris-Saclay. The goal of the program is to help to develop the research community in these fields, connecting academic and industrial researchers. It includes a research initiative on energy, led by S. Charousset from EDF (IROE, funding focused projects on the optimization of energy), and a subprogram dedicated to basic research (PRMO, funding smaller size projects). Projects are selected after an open call, instructed by the scientific committee of PGMO. The program organizes advanced invited lectures for PhD students and researchers (in 2016, lectures by Yuri Nesterov from Louvain and Jean-Bernard Lasserre from LAAS), a regular seminar, and an annual conference (PGMO days, 250 participants in 2016). The program is currently being renewed, with an opening to new industrial partners interested by optimization. See <https://www.fondation-hadamard.fr/PGMO> for more information on PGMO.

10.1.6. Research Administration

- M. Akian :
 - Member of the “comité de liaison SMAI-MODE” since June 2015.
- S. Gaubert :
 - Coordinator of PGM (Gaspard Monge Program for Optimization and Operations Research, a corporate sponsorship of EDF operated by FMJH).
 - Member of the scientific council of CMAP.
- X. Allamigeon:
 - Member of the scientific committee of Inria Saclay – Ile-de-France.
 - Member of the laboratory council of CMAP.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- M. Akian
 - Course “Markov decision processes: dynamic programming and applications” joint between (3rd year of) ENSTA and M2 “Mathématiques et Applications”, U. Paris Saclay, “Optimization”, and shared with Jean-Philippe Chancelier (ENPC), 15 hours each.
- X. Allamigeon
 - Petites classes et encadrement d’enseignements d’approfondissement de Recherche Opérationnelle en troisième année à l’École Polytechnique (programme d’approfondissement de Mathématiques Appliquées) (niveau M1).
 - Cours du M2 “Optimisation” de l’Université Paris Saclay, cours partagé avec Céline Gicquel et Dominique Quadri (LRI, Université Paris Sud).
 - Co-responsabilité du programme d’approfondissement en mathématiques appliquées (troisième année) à l’École Polytechnique.
- V. Boeuf
 - Petite classe du cours de tronc commun de 1ere année "Introduction à l’optimisation" de l’École des ponts (ENPC), niveau L3.
- S. Gaubert
 - Course “Systèmes à Événements Discrets”, option MAREVA, ENSMP.
 - Course “Algèbre max-plus pour le contrôle optimal et les jeux” of “Parcours Optimisation, Jeux et Dynamique” (ODJ) of M2 “Mathématiques et Applications” of Paris 6 University and École Polytechnique.
 - Lecture of Operations Research, third year of École Polytechnique. The lectures notes were published this year as a book [46].
- A. Hochart
 - Cours de niveau L1 et L2 à l’Univ. Paris Diderot (Paris VII), dans le cadre d’un monitorat (34h).
- M. Skomra
 - Petite classe du cours de tronc commun de 1ere année "Introduction à l’optimisation" de l’École des ponts (ENPC), niveau L1.
- N. Stott
 - Cours et TD “Introduction à la programmation graphique en C++”, option MAREVA et semaine Athens à l’ENSMP (École des Mines de Paris), niveau M1.

10.2.2. Supervision

- PhD: Antoine Hochart, registered at École Polytechnique, since October 2013, thesis supervisor: Stéphane Gaubert, cosupervision: Marianne Akian, defended on 14 Nov 2016.
- PhD in progress : Eric Fodjo, registered at École Polytechnique, since October 2013, thesis supervisor: Marianne Akian.
- PhD in progress : Nikolas Stott, registered at École Polytechnique, since October 2014, thesis supervisor: Stéphane Gaubert, cosupervision: Xavier Allamigeon, Éric Goubault, Sylvie Putot.
- PhD in progress : Vianney Boeuf, registered at École Polytechnique, since October 2014, thesis supervisor: Stéphane Gaubert, cosupervision: Stéphane Raclot (BSPP), Marianne Akian, Xavier Allamigeon.
- PhD in progress : Mateusz Skomra, registered at Univ. Paris Saclay since October 2015, thesis supervisor: Stéphane Gaubert, cosupervision: Xavier Allamigeon.
- PhD in progress : Jean-Bernard Eytard, registered at Univ. Paris Saclay since October 2015, thesis supervisor: Stéphane Gaubert, cosupervision: Marianne Akian, Mustapha Bouhtou.
- PhD in progress: Paulin Jacquot, registered at Univ. Paris Saclay since November 2016, thesis supervisor: Stéphane Gaubert, cosupervision: Nadia Oujdane, Olivier Beaudé (EDF).

10.2.3. Juries

- M. Akian
 - Vice-president of the jury of the 2016 competition for CR2 positions of Inria Saclay–Île-de-France.
 - Member of the jury selecting the 2016 PGMO PhD price.
 - Jury of the PhD thesis of A. Hochart (X, Palaiseau, November 2016).
- S. Gaubert
 - Member of hiring committee (Professor position) at Paris 6 University.
 - Member of hiring committee (Assistant Professor position) at Limoges University.
 - Jury of the HdR of A. Auger (Saclay, 2016).
 - Jury of the HdR of B. Scherrer (Nancy, reviewer, 2016).
 - Jury of the PhD thesis of C. Josz (Paris 6, reviewer, 2016).
 - Jury of the PhD thesis of A. Parmentier (ENPC, reviewer, 2016).
 - Jury of the PhD thesis of A. Hochart (X, Palaiseau, 2016).

10.3. Popularization

- J.P. Quadrat :
 - Webmaster of the site <http://www.maxplus.org>, dedicated to max-plus algebra.

10.4. Conferences, Seminars

- M. Akian
 - Conference “Emerging Trends in Applied Mathematics and Mechanics” (ETAMM), Perpignan, May 30 - June 3, 2016, Title of the talk: “Majorization inequalities for valuations of eigenvalues using tropical algebra”.
 - MTNS 2016 (22nd International Symposium on Mathematical Theory of Networks and Systems), Minneapolis, July 12-15, 2016, Title of the talk: “Solving Hamilton-Jacobi-Bellman equations by combining a max-plus linear approximation and a probabilistic numerical method”.

- Workshop “Numerical methods for Hamilton-Jacobi equations in optimal control and related fields” at the Radon Institute, Austrian Academy of Sciences, Linz, Austria, Nov. 21 - Nov. 25, 2016. Title of the talk: “Solving Hamilton-Jacobi-Bellman equations by combining a max-plus linear approximation and a probabilistic numerical method”.
- Dagstuhl Seminar “Algorithms and Effectivity in Tropical Mathematics and Beyond”, Nov. 28 - Dec. 02, 2016. Title of the talk: “Majorization inequalities for valuations of eigenvalues using tropical algebra”.
- X. Allamigeon
 - Journée Equipe McTAO, Inria Sophia Antipolis, January 18, 2016. Title of the talk: “Long and winding central paths”.
 - Conference “Emerging Trends in Applied Mathematics and Mechanics” (ETAMM), Perpignan, May 30 - June 3, 2016. Title of the talk: “Long and winding central paths”.
 - Groupe de travail combinatoire du Plateau de Saclay, June 8, 2016. Title of the talk: “Long and winding central paths”.
 - Dagstuhl Seminar “Algorithms and Effectivity in Tropical Mathematics and Beyond”, Nov. 28 - Dec. 02, 2016. Title of the talk: “Log-barrier interior-point methods are not strongly polynomial”.
 - Séminaire Parisien d’Optimisation, Paris, December 12, 2016. Title of the talk: “Log-barrier interior-point methods are not strongly polynomial”.
- V. Boeuf
 - Congrès annuel de la société Française de Recherche Opérationnelle et d’Aide à la Décision (ROADEF), Compiègne, February 10-12, 2016. Title of the talk: “Évaluation de performance en réception d’appels d’urgence : débits asymptotiques dans un réseau de Pétri avec priorités.”.
 - Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS), Taormina, October 25-28, 2016. Title of the talk: “Stationary solutions of discrete and continuous Petri nets with priorities”.
- J.B. Eytard
 - PGM Days, Nov. 8-9, 2016, Palaiseau. Title of the talk: “Price incentives in mobile networks: a tropical approach”.
- E. Fodjo
 - 9th European Summer School in Financial Mathematics, Aug. 29- Sep. 2, 2016, St Petersburg, Russia. Title of the talk: “A probabilistic max-plus numerical method for solving stochastic control problems”.
 - SIAM Conference on Financial Mathematics & Engineering, Nov. 17-19, 2016, Austin, Texas, USA. Title of the talk: “A probabilistic max-plus numerical method for solving stochastic control problems”.
 - 55th Conference on Decision and Control (CDC 2016), Dec. 12-14, 2016, Las Vegas, USA. Title of the talk: “A probabilistic max-plus numerical method for solving stochastic control problems”.
- S. Gaubert
 - International Conference on Tensors, Matrices and their Applications, Chern Institute of Mathematics, Nankai University, Tianjin, 20-24 May 2016. Title of the talk: “Ergodicity conditions in non-linear Perron-Frobenius theory and application to nonnegative tensors”.
 - SIAM Conference on Discrete Mathematics, Atlanta, June 6-10, 2016. Title of the talk: “Stochastic mean payoff games are tropical semidefinite programs”.

- Workshop: Advances in Convex Analysis and Optimization Erice July 6-11, 2016. Title of the talk: “Zero-sum games, non-archimedean convexity and sinuous central paths”.
- 2016 Conference on Applied Mathematics, The University of Hong Kong Aug 23-26, 2016. Title of the talk: “Zero-sum games, non-archimedean convexity and sinuous central paths”.
- Seminar of the algebraic geometry group at the University of Hong Kong, Aug 24, 2016. Title of the talk. “Tropical spectrahedra”.
- Dagstuhl Seminar “Algorithms and Effectivity in Tropical Mathematics and Beyond”, Nov. 28 - Dec. 02, 2016. Title of the talk “The equivalence between zero-sum games and tropical convexity”.
- A. Hochart
 - Game Theory PhD Seminar, Paris, February 1, 2016. Title of the talk: “Ergodic problems for zero-sum stochastic games”.
 - Conference SMAI-MODE, Toulouse, March 23-27, 2016. Title of the talk: “Une approche opérateur accréitif pour les jeux stochastiques avec critère ergodique”.
 - MTNS 2016 (22nd International Symposium on Mathematical Theory of Networks and Systems), Minneapolis, July 12-15, 2016, Title of the talk: “An Accretive Operator Approach to Ergodic Problems for Zero-Sum Games”.
- M. MacCaig
 - Birmingham Young Mathematicians Conference 2016. Title: “Tropical algebra: Optimisation, tropical polytopes and integer points”.
 - Student tropical algebraic geometry seminar (STAGS 2016), Yale. Title: “Calculating the volume of tropical polytopes is hard”.
 - ILAS 20th annual meeting, K.U.Leuven, July 11, 2016. Title: “Scaling to integer matrices in max-algebra”.
 - Dagstuhl Seminar on Algorithms and Effectivity in Tropical Mathematics.
- A. Niv
 - Conference “Recent advances in linear algebra and graph-theory”, U.T.Chattanooga, March 5-6, 2016. Title of the talk: “Introduction to tropical total positivity”.
 - Seminar at Afeka Academic College of Engineering, Tel-Aviv, May 8, 2016. Title of the talk: “Assignment problems via tropical matrices”.
 - Tropical symposium, ILAS 20th annual meeting, K.U.Leuven, July 11, 2016. Title of the talk: “Total non-negativity via valuations in tropical algebra”.
- M. Skomra
 - Conference SMAI-MODE, Toulouse, March 23–25, 2016. Title of the talk: “Les spectrahèdres tropicaux et leur relation aux jeux stochastiques”.
 - Conference “Emerging Trends in Applied Mathematics and Mechanics” (ETAMM), Perpignan, May 30 - June 3, 2016. Title of the talk: “Nonarchimedean semidefinite programming and stochastic games”.
 - Séminaire des doctorants du CMAP, Palaiseau, June 10, 2016. Title of the talk: “Une relation entre la programmation semi-définie paramétrique et les jeux stochastiques”.
 - Conference of the International Linear Algebra Society (ILAS), Leuven, July 11-16, 2016. Title of the talk: “Nonarchimedean semidefinite programming and stochastic games”.
 - International Symposium on Symbolic and Algebraic Computation (ISSAC), Waterloo, Ontario, Canada, July 19-22, 2016. Title of the talk: “Solving Generic Nonarchimedean Semidefinite Programs using Stochastic Game Algorithms”.

- Conference PGMO Days, EDF Labs Paris-Saclay, November 8-9, 2016. Title of the talk: “Solving Generic Nonarchimedean Semidefinite Programs using Stochastic Game Algorithms”.
- Dagstuhl Seminar “Algorithms and Effectivity in Tropical Mathematics and Beyond”, Nov. 28 - Dec. 02, 2016. Title of the talk: “Tropical spectrahedra and stochastic mean payoff games”.
- C. Walsh
 - Conference “New Methods in Finsler Geometry”, Leipzig, July 5-9, 2016. Title of the talk: “Studying isometry groups using the horofunction boundary”.

ANJA Team

7. Dissemination

7.1. Promoting Scientific Activities

7.1.1. Scientific Events Organisation

7.1.1.1. Member of the Organizing Committees

Bayesian workshop : Bayesian statistics applied to archaeology - May 2016 Nantes
Anne Philippe and Marie-Anne Vibet were main organizers.

7.1.2. Journal

Anne Philippe is an Associated editor of Computational Statistics and Data analysis
Jacques Lévy Véhel is associate editor of the journal « Fractals »

7.1.3. Invited Talks

Anne Philippe and Marie-Anne Vibet were invited to the Ibercrono conference, Barcelone Spain, October 2016

Anne Philippe was invited to ArcheoFoss, Cagliari Italy October 2016

Yue Huang gave a talk at the invited session of advanced SAR technologies at IEEE International Geoscience and Remote Sensing Symposium, Beijing Chine, 2016

7.1.4. Research Administration

Anne Philippe is a member of commits national du CNRS

7.2. Teaching - Supervision - Juries

7.2.1. Teaching

- Marie-Anne Vibet: Introduction to SAS software, Master 2 Ingénierie Mathématique, January and November 2016 (12hrs)
- Anne Philippe : Statistical inference, Master 1 Ingénierie Mathématique, Automne 2016 (24hrs)
- Anne Philippe : Bayesian statistics, Master 2 Ingénierie Mathématique, Automne 2016 (36hrs)

7.2.2. Supervision

- PhD in progress: Vytautė Pilipauskaitė, supervised by Anne Philippe and Donatas Surgailis
- PhD in progress: Caroline Robet, supervised by Anne Philippe and Jacques Lévy-Véhel

7.2.3. Juries

Anne Philippe was in the jury of PhD theses :

- President of jury for Kaniav Canary
- Reporter and member of jury for Lilliam Urrego, Le Quyen Thieu

DOLPHIN Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

- N. Melab: Chair of the HPCS'2016 workshop (Parallel Optimization using / for Multi and Many-core High Performance Computing) organized in conjunction with HPCS'2016, Innsbruck, Austria, June 7th 2015.
- N. Melab: Chair of 5 simulation and HPC-related seminars at Lille 1 oct-dec. 2016 (CENAERO, Intel, Atos-Bull, FFT, UPMC).
- E-G. Talbi: General chair of META'2016 Int. Conf. on Metaheuristics and Nature Inspired Computing, Marrakech, Morocco, Oct 2016, 105 participants.
- E-G. Talbi, Program co-chair of HM'2016 Int. Conf on Hybrid Metaheuristics, Exeter, UK, May 2016.

10.1.1.2. Member of the Organizing Committees

- D. Brockhoff: co-organizer of the Surrogate-Assisted Multi-Criteria Optimization workshop at the Lorentz Center in Leiden, The Netherlands, Feb/Mar 2016
- D. Brockhoff: co-organizer of the Blackbox Optimization Benchmarking workshop (BBOB-2016) at GECCO in Denver, CO, USA
- CEC 2016 special session entitled "Advances in Decomposition-based Evolutionary Multiobjective Optimization", Vancouver, Canada, organized by Saul Zapotecas Martinez, Bilel Derbel, Qingfu Zhang, Carlos A. Coello Coello, July 2016
- E-G. Talbi: organisation of META'2016 Int. Conf. on Metaheuristics, Marrakech, Morocco, Oct 2016.

10.1.2. Scientific Events Selection

10.1.2.1. Chair of Conference Program Committees

- E-G. Talbi, HM'2016
- E-G. Talbi, META'2016

10.1.2.2. Member of the Conference Program Committees

- CEC -IEEE Congress on Evolutionary Computation 2016
- CIBCB - IEEE Symposium on Computational Intelligence in Bioinformatics and Computational Biology 2016
- GECCO conference 2016
- HM 2016
- ICORES 2016
- LION Conference 2016
- MICAI 2016
- MIM 2016
- MOD 2016
- PPSN 2016

- ROADEF 2016
- GECCO conference 2016
- IEEE Congress on Evolutionary Computation (CEC), Vancouver, Canada, July 24-29, 2016
- The ACM Genetic and Evolutionary Computation Conference (GECCO), Denver, Colorado, USA, July 20-24, 2016
- IEEE International Workshop on Nature Inspired Distributed Computing (IPDPS/NIDISC'2016), Chicago, Illinois, USA, May 23-27, 2016
- IEEE Intl. Workshop on Parallel Computing and Optimization (IPDPS/PCO), Chicago, Illinois, USA, May 23-27, 2016
- Grid'5000 winter school, Grenoble, France, February 2-5, 2016
- Colloque sur l'Optimisation et les Systèmes d'information (COSI), Sétif, Algérie, May 30 - June 1, 2016
- Intl. Conf. on Contemporary Computing (IC3), Noida, India, Aug. 11-13, 2016
- The 2nd Intl. Conf. on Cloud Computing Technologies and Applications (CloudTech), Marrakesh, Morocco, May 24-26, 2016.
- 8th IEEE Intl. Conf. on Cloud Computing Technology and Science (CloudCom), Luxembourg, Dec. 12-15, 2016
- PPSN 2016: 14th International Conference on Parallel Problem Solving from Nature (Edinburgh, UK, 2016)
- GECCO 2016: Genetic and Evolutionary Computation Conference, Evolutionary Combinatorial Optimization and Metaheuristics (ECOM) track (Denver, USA, 2016)
- CEC 2016: IEEE Congress on Evolutionary Computation (Vancouver, Canada, 2016)
- EvoCOP 2016: 16th European Conference on Evolutionary Computation in Combinatorial Optimisation (Porto, Portugal, 2016)

10.1.2.3. Reviewer

- Dimo Brockhoff: CEC'2016, GECCO'2016 (EMO track), PPSN'2016, FOGA'2017, EMO'2017

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- L. Jourdan: Review Editor *Frontiers in Big Data*
- N. Melab: Guest Editor (in collaboration with M. Mezmaç) of a special on Multi/Many-core computing for parallel Metaheuristics in *Wiley Concurrency and Computation: Practice and Experience*, April 2016.
- N. Melab: Guest Editor (in collaboration with A. Zomaya and I. Chakroun) of a special on Parallel Optimization using/for Multi and Many-core High Performance Computing in *Journal of Parallel and Distributed Computing (JPDC)*, 2016.
- E-G. Talbi : Editor of the Journal « *Computers and Industrial Engineering (CAIE, Elsevier)* » Area «Computational Intelligence».

10.1.3.2. Reviewer - Reviewing Activities

- *IEEE Transactions on Evolutionary Computation, Evolutionary Computation, Journal of Heuristics, Artificial Intelligence Journal*
- *Applied Soft Computing*
- *Computers in Biology and Medicine*
- *Computers & Industrial Engineering*
- *Computers & Operations Research*

- EJOR European Journal of Operational Research
- IEEE Transaction on Evolutionary Computation
- International Journal of Metaheuristics
- International Journal of Molecular Sciences
- International Journal of Production research
- International Transactions in Operational
- JOH Journal of Heuristics
- JOCO Journal of Combinatorial Optimization
- JPDC Journal of Parallel and Distributed Computing
- Nature Scientific Report
- Soft Computing (SOCO)
- Transactions on Computational Biology and Bioinformatics
- ACM Computing Surveys
- Computation and Concurrency: Practice and Experience (CCPE)
- Parallel Processing Letters
- Parallel Computing
- Journal of Parallel and Distributed Computing (JPDC)
- 4OR: A Quarterly Journal of Operations Research (Springer)
- ASOC: Applied Soft Computing (Elsevier)
- CAIE: Computers & Industrial Engineering (Elsevier)
- ITOR: International Transactions in Operational Research (Wiley)
- NEUCOM: Neurocomputing (Elsevier)

10.1.4. Invited Talks

- D. Brockhoff: invited talk on multiobjective optimization, MEXICO/Mascot-Num meeting, Nov 2016, Nantes
- D. Brockhoff: invited tutorial at GECCO'2016 on Evolutionary Multiobjective Optimization, Jul 2016, Denver, CO, USA
- B.Derbel and A. Liefoghe: Designing and understanding EMO algorithms, Invited talk, City University, Hong Kong, November 2016
- A. Liefoghe: Fitness landscape analysis, problem features and performance prediction for multi-objective optimization, Workshop on Landscape-aware heuristic search (PPSN 2016), Edinburgh, UK, September 2016 (joint work with Fabio Daolio, Sébastien Verel, Hernan Aguirre, and Kiyoshi Tanaka)
- L. Jourdan, "Combinatorial optimization for Bioinformatics", invited talk (1day), summer school of Bioinformatics, Angers, 2016
- L. Jourdan, "The emerging use of Optimization methods for Datamining in Big Data", invited talk, summer school of Cyber-Physical Systems (CPS), Toulouse, 2016.
- L. Jourdan, "Modélisation et optimisation multi-objectif pour l'extraction de connaissances Le cas des applications médicales", Mars 2016, Séminaire Expert, Worldline.
- C. Dhaenens "Exemple de collaboration réussie entre l'entreprise et le monde de la recherche", CCI Grand Lille, Fev. 2016.
- N. Melab: Tutorial on Grid'5000, Arcus international project "E2D2", May 2016, Université Lille 1.

- E-G. Talbi: Multi-objective metaheuristics, Invited seminar, Colorado State University, Fort Collins, Colorado, USA, Mar 2016.
- E-G. Talbi: Optimization under uncertainty, Invited seminar, Univeridad Elche, Elche, Spain, Apr 2016.
- E-G. Talbi: Parallel evolutionary algorithms for multi-objective optimization, Keynote speaker BIOMA'2016 7th Int. Conf. on Bioinspired Optimization Methods and their Applications, Bled, Slovenia, May 2016.
- E-G. Talbi: Parallel metaheuristics, Invited seminar, CINVESTAV, Mexico, Sept 2016.
- E-G. Talbi: Combining metaheuristics with mathematical programming and data mining, Keynote speaker, NEO'2016 Int. Workshop on Numerical and Evolutionary Optimization, Tlalneptla, Mexico, Sept 2016.
- E-G. Talbi: A survey of hybrid metaheuristics with exact methods and machine learning, Tutorial, META'2016 Int. Conf. on Metaheuristics and Nature Inspired computing, Marrakech, Morocco, Oct 2016.

10.1.5. Leadership within the Scientific Community

- L. Jourdan : Co-president of the working group “ATOM: Multi-objective optimization”, GDR RO.
- L. Jourdan, A. Liefoghe : Secretary of the association “Artificial Evolution” (EA).
- C. Dhaenens: member of the scientific council of GDR RO (Operations research)
- C. Dhaenens: nominated member at Co-NRS, section 6 (National committee of CNRS)
- N. Melab: scientific leader of Grid'5000 (<https://www.grid5000.fr>) at Lille, Since 2004
- N. Melab: Chargé de Mission of High Performance Computing and Simulation at Université Lille 1, Since 2010
- E-G. Talbi : Co-president of the working group “META: Metaheuristics - Theory and applications”, GDR RO and GDR MACS.
- E-G. Talbi : Co-Chair of the IEEE Task force on Cloud Computing within the IEEE Computational Intelligence Society.

10.1.6. Scientific Expertise

- D. Brockhoff: external reviewer of a research proposal for the National Science Centre Poland
- N. Melab: Member of the advisory committee for the IT and management engineer training at Faculté Polytechnique de Mons
- E-G. Talbi : Expert for Qatar Foundation QNRF projects, 2016.

10.1.7. Research Administration

- C. Dhaenens: Vice-head of CRISAL laboratory (Centre de Recherche en Informatique, Signal et Automatique de Lille), common to CNRS, University of Lille and Ecole Centrale de Lille, 430 people.
- L. Jourdan: member of the Bureau du Département de domaine Informatique pour l'école doctorale SPI, University of Lille
- N. Melab: Member of the steering committee of “Maison de la Simulation” at Université Lille 1
- E-G. Talbi, Coordinator of the International Relationships of Inria Lille Nord Europe.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- Master : Dimo Brockhoff, Introduction to Optimization, 18h ETD, M2 Apprentissage, Information et Contenu, U. Paris-Saclay, France

- Master : Dimo Brockhoff, Advanced Optimization, 18h ETD, M2 Apprentissage, Information et Contenu, U. Paris-Saclay, France
- Master : Dimo Brockhoff, Introduction to Optimization, 54h ETD, MSc in Data Sciences & Business Analytics, CentraleSupélec/ESSEC, France
- Master : Laetitia Jourdan, Business Intelligence, 30h, M1, University of Lille 1, France
- Master : Laetitia Jourdan, Datamining, 60h , M1, University of Lille 1, France
- Master : Laetitia Jourdan, Datawarehouse, 30h, M1, University of Lille 1, France
- Licence: Laetitia Jourdan : Informatique, 48h, L1 University of Lille 1, France
- Master: Laetitia Jourdan : Responsible of Master MIAGE Formation en Alternance, ,University of Lille 1, France
- Licence: Laetitia Jourdan: Co-responsible of Licence 1 Computer Science, University of Lille 1, France
- Engineering school : Clarisse Dhaenens, Graphs and Combinatorics, 80 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school : Clarisse Dhaenens, Operations Research, 70 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school : Clarisse Dhaenens, Algorithmics and programming, 45 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school : Clarisse Dhaenens, responsible of the 5th year of statistics and computer science department.
- Engineering school : Marie-Eléonore Kessaci, Graphs and Combinatorics, 44 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school : Marie-Eléonore Kessaci, Algorithmics and programming, 51 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school : Marie-Eléonore Kessaci, Databases, 71 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school : Marie-Eléonore Kessaci, Mathematics, 20 HeqTD, Polytech Lille, University Lille 1, France
- Engineering school : Marie-Eléonore Kessaci, responsible of the 3th year of statistics and computer science department.
- Master lecture: N. Melab, Supercomputing, 24h, Master 2, Université Lille 1, France
- Master lecture: N. Melab, Operations Research, 78h, Master 1, Université Lille 1, France
- Master leading: N. Melab, Co-head (with C. Chainais) of the master 2 of advanced scientific computing, U. Lille 1
- Licence: A. Liefoghe, Algorithmic and Data structure, 36h ETD, L2, Université de Lille 1, France
- Licence: A. Liefoghe, Algorithmic for Operations Research, 36h ETD, L3, Université de Lille 1, France
- Master: A. Liefoghe, Databases, 30h ETD, M1, Université de Lille 1, France
- Master: A. Liefoghe, Advanced Object-oriented Programming, 53h ETD, M2, Université de Lille 1, France
- Master: A. Liefoghe, Combinatorial Optimization, 10h ETD, M2, Université de Lille 1, France
- Master: A. Liefoghe, Multi-criteria Decision Aid and Optimization, 25h ETD, M2, Université de Lille 1, France
- A. Liefoghe is supervising the Master 2 MIAGE IPI-NT
- Master : Bilel Derbel, Combinatorial Optimization, 35h, M2, University Lille 1, France

- Master : Bilel Derbel, Grid Computing, 16h, M2, University Lille 1, France
- Master : Bilel Derbel, Parallel and Distributed Programming, 35h, M1, University Lille 1, France
- Master : Bilel Derbel, Algorithms and Applications, 28h, M1, University Lille 1, France
- Engineering school : El-Ghazali Talbi, Advanced optimization, 36h, Polytech'Lille, University Lille 1, France
- Engineering school : El-Ghazali Talbi, Data mining, 36h, Polytech'Lille, University Lille 1, France
- Engineering school : El-Ghazali Talbi, Operations research, 60h, Polytech'Lille, University Lille 1, France
- Engineering school : El-Ghazali Talbi, Graphs, 25h, Polytech'Lille, University Lille 1, France

10.2.2. Supervision

- PhD in progress: Gauvain Marquet, Mono-objective decomposition for multi-objective optimization, University Lille 1, Sep. 2014, Bilel Derbel and El-Ghazali Talbi
- PhD in progress: Maxence Vandromme, Datamining et optimisation combinatoire adaptés à la prévention et à l'orientation de patients, début : 1/06/2014, CIFRE with Alicante Co-direction : Clarisse Dhaenens and Laetitia Jourdan
- PhD in progress : Sylvain Dufourny, Optimisation de décisions économiques concurrentielles dans un simulateur de gestion d'entreprise, Novembre 2012, Clarisse Dhaenens
- PhD in progress : Aymeric Blot, Réagir et s'adapter à son environnement : Concevoir des méthodes autonomes pour l'optimisation combinatoire à plusieurs objectifs, september 2015, co-directed Laetitia Jourdan and Marie-Eléonore Marmion
- PhD in progress : Lucien Mousin, Exploiter la connaissance pour mieux optimiser, october 2015, co-directed Clarisse Dhaenens and Marie-Eléonore Marmion
- PhD in progress : AnneLise Bedenel, Classification supervisée et non supervisée en présence de descripteurs évoluant dans le temps. Application à la comparaison d'assurances en ligne, co-directed Laetitia Jourdan and Christophe Biernacki (Modal Inria Team)
- PhD (cotutelle in progress): Jan GMYS, Parallel Branch-and-Bound for solving permutation problems on multi- and many-core clusters, Nouredine Melab (Université Lille 1) and Daniel Tuytens (UMONS, Belgium), Defense end of 2017
- PhD in progress : A. Q. Nguyen, Green scheduling on cloud computing systems, 11/2012, El-Ghazali Talbi and Pascal Bouvry
- PhD in progress : Oumayma Bahri, Fuzzy multi-objective optimization, 11/2013, El-Ghazali Talbi and Nahla Ben-Omar
- PhD in progress : Sohrab Faramarzi, Optimization of medical lab, 02/2016, El-Ghazali Talbi

10.2.3. Juries

- C. Dhaenens: PhD Thesis: B. Tounsi, "Contributions à la chaîne logistique e-commerce : Intégration dans l'e-fulfillment et tarification de services de livraison", Université Lille 1, Dec. 2016.
- C. Dhaenens: HDR : L. Boudjeloud, "Approches coopératives et semi-interactives pour le traitement de données massives et temporelles", Université de Lorraine, Dec. 2016.
- L. Jourdan: PhD Thesis: Métaheuristiques hybrides distribuées et massivement parallèles, de Omar ABDELKAFI Université de Haute Alsace, November 7th 2016 (Présidente de Jury)
- L. Jourdan: PhD Thesis: Le routage avec transbordement et collaboration, de Nicolas Danloup, Université de Béthune Artois, December 1st 2016 (Présidente de Jury) Hyperheuristics in Logistics, de Kassem DANACH, Ecole Centrale Lille, December 21st 2016 (Présidente de Jury).
- L. Jourdan: PhD Thesis: Contribution à la synthèse et l'optimisation multi-objectif par essais particuliers de lois de commande robuste RST de système dynamique, de 'Riadh Madiouni', de l'Université Paris Est - Créteil, June 20th 2016 (Rapporteur)

- L. Jourdan: PhD Thesis: A dynamic programming operator for metaheuristics to solve vehicle routing problems with optional visits, de 'Leticia VARGAS' du LAAS-CNRS, June 24th 2016. (Rapporteur)
- L. Jourdan: PhD Thesis: Conception d'alliages par optimisation combinatoire multiobjectifs : thermodynamique prédictive, fouille de données, algorithmes génétiques et analyse décisionnelle de 'Edern Menou' Université de Nantes, October 19th 2016. (Rapporteur)
- HDR: Sebastien Verel, "Apport à l'analyse des paysages de fitness pour l'optimisation mono-objective et multi-objective", Université du Littoral - Côte d'Opale, December 12th, 2016.
- PhD thesis: Ania Kaci, "Conception d'une architecture extensible pour le calcul massivement parallèle", Université Paris-Est, December 14th, 2016.
- PhD thesis: Escobar Fernando, "High Performance Computing Architectures based on Reconfigurable Platforms for Scientific Applications, Université de Mons, March 30th, 2016.
- PhD thesis: K. Lefrouni, "Contrôle de congestion dans les réseaux de communication", EMI – Université Mohammed V Rabat, Maroc, Jan 2016.
- PhD thesis: S. Nielsen, "Diversity preserving genetic algorithms – Application to the inverted folding problem and analogous formulated benchmarks", University of Luxembourg, Luxembourg, Feb 2016.
- PhD thesis: K. E. Vazquez Ortiz, "Advanced methods to solve the maximum parsimony problem", Université d'Angers, France, June 2016.
- PhD thesis: Urrego Agudelo Lilliam, "A novel method for the approximation of risk of blackout in operational conditions", Université Paris-Est, Créteil, Nov 2016.

10.3. Popularization

- Clarisse Dhaenens, Fanny Dufossé, Laetitia Jourdan, Marie-Eléonore Marmion: Operational research - for 2nde during integration week (June 2016)
- Laetitia Jourdan, Marie-Eléonore: Computer Unplugged, Numériqu'elle Day (November 2016)
- Laetitia Jourdan: Computer Unplugged, Primary School (December 2016)

GEOSTAT Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

H. Yahia: organization of the conference *Signals & Physics* in October 2016, Inria Paris.

9.1.1.2. Member of the Organizing Committees

H. Yahia: organization of the conference *Signals & Physics* in October 2016, Inria Paris.

9.1.2. Scientific Events Selection

9.1.2.1. Chair of Conference Program Committees

H. Yahia, N. Brodu and K. Daoudi are members of the advisory board committee of the IEEE *11th International Conference on Industrial and Information Systems (ICIIS 2016)*, 3-4 December 2016, IIT Roorkee, India, <http://www.iciis2016.org/commitee.html>.

9.1.2.2. Member of the Conference Program Committees

N. Brodu is co-organizing an EGU session (European Geophysical Union) and has presented 2 papers in the session.

9.1.2.3. Reviewer

H. Yahia and N. Brodu have reviewed papers for the ICIIS 2016 conference.

9.1.3. Journal

9.1.3.1. Member of the Editorial Boards

- G. Attuel is a member of the editorial board of CMSIM journal (from CHAOS Conference), sections plasma and biophysics.
- H. Yahia: *Frontiers in Fractal Physiology*.

9.1.3.2. Reviewer - Reviewing Activities

- N. Brodu: PRL (physical review letters), PRE, Remote Sensing.
- K. Doudi: reviewer for IEEE Transactions on Audio, Speech and Language Processing.
- H. Badri: ICIP Conference.

9.1.4. Invited Talks

- H. Badri is invited to give an oral presentation at the conference RFIA 2016 for the reception of his AFRIF 2015 Best PhD award. Title of the presentation: *Sparse and Scale-invariant methods in image processing*.
- H. Yahia was an invited keynote speaker at the 11th International Conference on Industrial and Information Systems (ICIIS 2016), 3-4 December 2016, IIT Roorkee, India. Title: *Non-convex sparsity. Applications in Image processing*.
- N. Brodu was an invited keynote speaker on the subject of super-resolution at the 11th International Conference on Industrial and Information Systems (ICIIS 2016), 3-4 December 2016, IIT Roorkee, India. Title: *Super-resolving multiresolution images with band-independent geometry of multispectral pixels*.

9.1.5. Leadership within the Scientific Community

- N. Brodu has given a presentation at the RISC-E school held at Rennes in October 2016. The presentation corresponds to 2 master UE.
- N. Brodu has given a presentation in february 2016 at the LaBRI/IMS/IMB lab: *Super-resolution of multispectral images* (part 1) and *Stochastic image analysis* (part 2).

9.1.6. Scientific Expertise

- H. Yahia and K. Daoudi have proposed scientific expertise for the I2S company, with an industrial collaboration prepared and submitted for 2017.
- H. Yahia and N. Brodu have proposed scientific expertise for the LECTRA company.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Doctorat: H. Yahia, *Advancement in Signal Processing, Application to Earth Observation*, 30 hours, IIT Roorkee, GIAN courses, India.

Master : K. Daoudi, *financial mathematics*, 20 hours, Master2 MIAGE, University of Lorraine.

Master: N. Brodu, *Analyse de données massives par apprentissage automatique*, 2 days, EDM I Bordeaux.

Licence : A. El Aouni, *Programmation web (PHP, javascript, CSS)*, 24 hours, L3, Rabat University, Morroco.

9.2.2. Juries

- H. Yahia: member of the HDR jury of S. Jacquir (Bourgogne University, Laboratoire LE2I UMR CNRS 6306).
- N. Brodu: 1st year PhD jury.

9.3. Popularization

N. Brodu has given a presentation at Inria's *Unithé ou café* : (April 1st): Title: « Des images satellites aux messages sur les sites »

INOCS Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. Member of the Organizing Committees

Luce Brotcorne:

- Meeting of the EURO Working group on Pricing and Revenue Management, Hamburg, Germany, April 2016.

Bernard Fortz:

- Winter School on Network Optimization, Estoril, Portugal, January 2016.

9.1.2. Scientific Events Selection

9.1.2.1. Chair of Conference Program Committees

Bernard Fortz:

- INFORMS Telecommunications conference, Boca Raton, FL, USA, March 2016.

9.1.2.2. Member of the Conference Program Committees

Luce Brocorne:

- ROADEF 2016, Compiègne, France, February 2016.
- EURO 2016, Stream Organizer, Poznan, Poland, July 2016.

Bernard Fortz:

- ORBEL 30, Louvain-la-Neuve, Belgium, January 2016.

Martine Labbé:

- DRCN, Paris, France, March 2016.
- International Symposium on Combinatorial Optimization (ISCO), Vietri sul Mare, Italy, May 2016.
- Ninth Triennial Symposium on transportation analysis (TRISTAN IX), June 2016.
- Meeting of the EURO working group on Locational Decisions (EWGLA), Malaga, Spain, September 2016.
- XLVIII Brazilian Symposium on Operational Research (XLVIII SBPO), Vitória, Brazil, September 2016.
- Matheristics 2016, Brussels, Belgium, September 2016.

Frédéric Semet:

- Ninth Triennial Symposium on transportation analysis (TRISTAN IX), June 2016.
- National Conference of the Tunisian Operations Research Society (TORS), December 2016.

9.1.3. Journal

9.1.3.1. Member of the Editorial Boards

Luce Brotcorne:

- Associate editor: Computers and Operations Research

Bernard Fortz:

- Associate editor: INFORMS Journal on Computing
- Guest editor of special issues of Networks and EURO Journal on Computational Optimization

Martine Labbé:

- Editor in chief: EURO Journal on Computational Optimization
- Associate editor: International Transactions in Operations Research
- Member of the Advisory Board: Transportation Science

9.1.4. Invited Talks

Luce Brotcorne:

- CESO 2016, Plenary speaker, Paris, France, May 2016
- EDF Lab Seminar, Paris, France, France, September 2016
- RIM seminar, Erasmus, Rotterdam, Netherlands, December 2016.

Diego Cattaruzza:

- Invited seminar, HEC-École de gestion de l'université de Liège, Liège, Belgium, February 2016.

Bernard Fortz:

- OMOR seminar, ESSEC, Cergy, France, December 2016.
- SDN day 2016, Orange Gardens, Paris, France, November 2016.

Martine Labbé:

- Winter School on Network Optimization, Invited Lecturer, Lisbon, Portugal, January 2016.
- First International Workshop in Bilevel Programming, Monterrey, Plenary Speaker, Mexico, March 2016.
- ROADEF Conférence, Plenary Speaker, Compiègne, France, February 2016.
- European Study Group with Industry, Plenary Speaker, Avignon, France, May 2016
- Graphs and Optimization (GO) Meeting, Plenary Speaker, Rigi Kaldbad, Switzerland, July 2016.
- Séminaire POC15, Plenary Speaker, Paris, France, October 2016 .

Frédéric Semet

- Symposium in honor of G. Laporte, Eindhoven, Netherlands, April 2016.
- AIRO Conference, Plenary Speaker, Trieste, Italy, September 2016.

9.1.5. Leadership within the Scientific Community

Luce Brotcorne:

- Coordinator of EURO Working Group: "Pricing and Revenue Management".

Bernard Fortz:

- Member of the board of administration and treasurer of ORBEL (Belgian OR Society).
- ORBEL representative for EURO and IFORS.

- Coordinator of EURO Working Group: “European Network Optimization Group (ENOG)”.

Martine Labbé:

- Vice-chair of the SIAM Activity Group on Optimization (SIAG/OPT).
- Chair of the SIAG/Optimization Prize committee.

Frédéric Semet:

- Member of the board of EURO Working Group: “Vehicle routing and logistics optimization (VEROLOG)”.
- Member of the steering committee of CNRS GdR 3002 : Operations Research.
- Coordinator of GdR Working Group: “Transportation and Logistics (GT2L)”.

9.1.6. Scientific Expertise

Luce Brotcorne:

- Member of the scientific committee of France-Netherlands Exchange Program.
- Member of the evaluation committee for Inria/MITACS Exchange Program.

Bernard Fortz:

- President of the FRIA PE1 - jury 1.
- Member of the CIRRELT scientific orientation committee.

Martine Labbé:

- Member of the Scientific Advisory Board of IWR and its Graduate school HGS Math-Comp, Heidelberg University.
- Member of the Centro de Matemática, Aplicações Fundamentais e Investigação Operacional, University of Lisbon.
- Member of the 2016 selection jury for the research program “Mathematics and ...” of the Vienna Science and Technology Fund.

Frederic Semet:

- Member of the CIRRELT scientific orientation committee.
- Scientific board member of PICOM competitiveness cluster.
- Reviewer for Agence Nationale de la Recherche (ANR), Fond de Recherche Nature et Technologie du Québec.

9.1.7. Research Administration

Luce Brotcorne:

- Scientific Manager (correspondant scientifique) for international relations department
- Member of the International Relations working (COST-GTRI).
- Member of the committee for the Technological Development (CDT).
- Member of the committee for the recruitment of Junior Research Scientist (CR1/CR2) at Inria Bordeaux and Inria Lille in 2016
- Member of the committee for the recruitment of assistant professor at University of Valenciennes in 2016

Frédéric Semet:

- Deputy director of CRIStAL.
- Elected member of the scientific council of Centrale Lille

9.2. Teaching - Supervision - Juries

9.2.1. Supervision

PhD : Lijuan Zhang, Optimisation and Simulation of a cross-dock facility, 18/03/2016, Frédéric Semet, Benoit Trouillet

PhD : Diego Ponce Lopez, The Discrete Ordered Median Problem revisited: new formulations, properties and algorithms, Université Libre de Bruxelles, 18/07/2016, Martine Labbé, Justo Puerto

PhD : Martim Joyce Moniz, Models and methods for Traffic Engineering problems with single-path routing, Université Libre de Bruxelles, 06/10/2016, Bernard Fortz, Luis Gouveia

PhD : Sezin Afsar, Revenue Optimization and Demand Response Models using Bilevel Programming in Smart Grid Systems, 07/12/2016, Luce Brotcorne, Gilles Savard

PhD : Bayrem Tounsi, Contributions in E-commerce supply chain : Integration in E-fulfillment and delivery services pricing, 19/12/2016, Luce Brotcorne, Yezekael Hayel

PhD : Kacem Danach, Hyperheuristics in logistics 21/12/2016, Shahin Gelareh, Frédéric Semet

PhD in progress : Burak Celik, Models and methods for Stackelberg games using bilevel optimization and mixed integer linear programming, from Nov 2016, Luce Brotcorne, Martine Labbé

PhD in progress : Yaheng Cui, Models and methods for decentralized decision in logistics networks, from Oct 2016, Luce Brotcorne, Eric Ballot

PhD in progress : Wenjuan Gu, Location routing for short and local fresh food supply chain, from Oct 2016, Maxime Ogier, Frédéric Semet

PhD in progress : Léonard Von Niederhausen, Design and pricing of new services in energy in a competitive environment, from Oct 2015, Luce Brotcorne, Didier Aussel

PhD in progress : Yuan Yuan, Vehicle Routing Problems with Synchronization for City Logistics, from Oct 2016, Diego Cattaruzza, Frédéric Semet

PhD in progress : Carlos Casorrán Amilburu, Models and algorithms for Solving Bimatrix Stackelberg games, from October 2014, Martine Labbé.

PhD in progress : Jérôme De Boeck, Optimization problems in energy, from October 2015, Bernard Fortz.

PhD in progress : Luciano Porretta, Models and methods for the study of genetic associations, from May 2011, Bernard Fortz.

PhD in progress : Fabio Sciamannini, Column generation approaches for solving variants of node coloring problems, from October 2014, Bernard Fortz, Martine Labbé.

9.2.2. Juries

Luce Brotcorne:

- PhD : “Design, Planning and Execution of Sustainable Intermodal Port-Hinterland Transport Networks”, Ypsilantis Panagiotis, Erasmus University, Rotterdam. Rob Zuidwijk.

Bernard Fortz:

- PhD : “Revenue Optimization and Demand Response Models using Bilevel Programming in Smart Grid Systems”, Sezin Afşar, Inria Lille-Nord Europe. Luce Brotcorne and Gilles Savard.
- HdR : “Problèmes d’optimisation en milieu urbain : modèles, méthodes et défis”, Andréa Cynthia Santos, Université de Technologie de Troyes.
- PhD : “The discrete ordered median problem revisited: new formulations, properties and algorithms”, Diego Ponce, Université Libre de Bruxelles and Université de Séville. Martine Labbé and Justo Puerto.

- PhD : “Optimization of information flows in telecommunication networks” (rapporteur), Thibaut Lefebvre, CNAM. Sourour Elloumi, Eric Gourdin, Cédric Bentz.

Martine Labbé:

- PhD : “Recherche de flots stables dans des réseaux de transport multi-agents” (rapporteur), Nadia Chaabane, IUniversité de Toulouse. Cyril Briant and Marie-José Huguet.
- PhD : “Models and methods for Traffic Engineering problems with single-path routing”, Martim Joyce Moniz, Université Libre de Bruxelles, Bernard Fortz and Luis Gouveia.
- HdR : “Network Optimization: Algorithmic Approaches and Polyhedral Investigations:”, Markus Leitner, University of Vienna.

Frédéric Semet:

- PhD : “Design, Planning and Execution of Sustainable Intermodal Port-Hinterland Transport Networks”, Juliette Médina, Ecole des Mines de Nantes. Fabien Le Huédé, Olivier Peton.

9.3. Popularization

- PICOM workshop on Logistics, May 2016.
- Rendez-vous du Plateau Meetings: Prescriptive analytics for an agile logistics, December 2016.

MISTIS Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. Member of the Organizing Committees

- Stéphane Girard co-organized the workshop "Learning with functional data", held in Lille (October 2016), He was also a member of the organizing committee of "Journées MAS de la SMAI", held in Grenoble (August 2016)
- Florence Forbes and Stéphane Girard co-organized a session "Dimension reduction for regression" at the ERCIM conference in Séville, Spain (December 2016).
- Julyan Arbel organized the Bayesian nonparametric prediction session at the International Society of Bayesian Analysis Conference, June 2016. He also co-organized the StaTalk Workshop on Bayesian nonparametrics, Collegio Carlo Alberto, Moncalieri, Italy, February 19.

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

- Stéphane Girard was the president of the scientific committee of the CIMPA conference "Méthodes statistiques pour l'évaluation des risques extrêmes", held in Saint-Louis, Sénégal (April 2016), .
- Stéphane Girard was a member of the conference program committee of the "Mathematical Finance and Actuarial Sciences conference" organized by the AIMS (African Institute for Mathematical Sciences), Mbour, Sénégal (July 2016).

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- Stéphane Girard is Associate Editor of the *Statistics and Computing* journal since 2012 and Associate Editor of the *Journal of Multivariate Analysis* since 2016. He was co-editor of the book *Statistics for astrophysics, clustering and classification*, vol. 77, EDP sciences, 2016.
He is also member of the Advisory Board of the *Dependence Modelling* journal since december 2014.
- F. Forbes is Associate Editor of the journal *Frontiers in ICT: Computer Image Analysis* since its creation in Sept. 2014. *Computer Image Analysis* is a new specialty section in the community-run openaccess journal *Frontiers in ICT*. This section is led by Specialty Chief Editors Drs Christian Barillot and Patrick Boutheymy.

10.1.3.2. Reviewer - Reviewing Activities

In 2016, S. Girard has been a reviewer for *Australian and New Zealand Journal of Statistics, Extremes* and *Dependence Modelling*.

In 2016, F. Forbes has been a reviewer for *Journal of Multivariate Analysis, Statistics and Computing, Computational Statistics and Data Analysis* .

In 2016, Julyan Arbel has been reviewer for NIPS 2016, ICML 2016, AISTATS 2016, the *Annals of Statistics*, *Bayesian Analysis*, *Bernoulli*, *Biometrics*, the *Canadian Journal of Statistics*, the *Hacettepe Journal of Mathematics and Statistics*, the *Journal of Agricultural, Biological, and Environmental Statistics*, *SoftwareX*, *Statistics and Computing*.

10.1.4. Invited Talks

Stéphane Girard has been invited to give a talk to the following conferences:

- “Extreme value modeling and water resources” workshop (Aussois) [29],
- 3rd conference of the International Society for Non-Parametric Statistics (Avignon) [37],
- “Extremes - Copulas - Actuarial sciences” workshop (Luminy) [40],
- Statistics workshop at Tilburg University (Netherlands)
- ERCIM CFE-CMStatistics (Seville, Spain) [39].

Florence Forbes has been invited to give talks at :

- the 23th summer session of the Working Group on Model-based Clustering, Paris, July 18-23, 2016.
- the Fédération Rhône-Alpes-Auvergne day on multivariate data analysis in Grenoble, October 2016,
- the 11th Peyresq summer school on signal and image processing (July 2016): 5 hour lecture on Bayesian Analysis and applications [67].
- a special session on Dimension reduction for regression at the ERCIM CFE-CMStatistics conference, December 2016, in Seville, Spain [35],
- at the annual meeting of the MultiPlaNet project (Defi Imag’In CNRS) in Orsay in December 2016, on the inversion of the Hapke’s model from photometric measurements.

Julyan Arbel has been invited to give talks at the following seminars and conferences:

- Rencontres Statistiques Lyonnaises, Institut Camille Jordan, November 23. Invited talk: Bayesian nonparametric inference for discovery probabilities.
- Séminaire de Statistique du LJK, Université Grenoble Alpes, November 17. Invited talk: Bayesian nonparametric inference for discovery probabilities.
- The Bayes Club, Korteweg-de Vries Institute for Mathematics, University of Amsterdam, October 7. Invited talk: Bayesian nonparametric inference for discovery probabilities.
- Séminaire de Statistique, Université Lille 3, October 6. Invited talk: Bayesian nonparametric inference for discovery probabilities.
- Séminaire de Proba-Stat, Université Paris 12 Créteil, October 4. Invited talk: Bayesian nonparametric inference for discovery probabilities.
- Séminaire de Proba-Stat, Université de Franche-Comté, Besançon, September 5. Invited talk: Bayesian nonparametric inference for discovery probabilities.
- ISBA World Meeting, Sardinia, Italy, June 13-17. Invited talk: Bayesian nonparametric inference for discovery probabilities.
- Mistis Seminar, Inria Grenoble, France, February 12. Talk: Infinite mixture models in Bayesian nonparametrics.

Julyan Arbel presented at the following contributed sessions in conferences and workshops:

- NIPS Meeting, Barcelona, Spain, Poster: Truncation error of a superposed gamma process in a decreasing order representation, Poster: Advances in Approximate Bayesian Inference workshop, Dec 9.
- NIPS Meeting, Barcelona, Spain, Sequential Quasi Monte Carlo for Dirichlet Process Mixture Models, Practical Bayesian Nonparametrics workshop, Dec 9.
- Journées MAS, Grenoble, France, August 29-31. Poster: Bayesian nonparametrics, why and how?
- Third Bayesian Young Statisticians Meeting, Florence, Italy, June 19-21. Talk: A moment-matching Ferguson & Klass algorithm.

- Journées de Statistique de la SFdS, Montpellier, France, May 30 - June 3. Talk: Bayesian nonparametric inference for discovery probabilities.
- StaTalk Workshop, Collegio Carlo Alberto, Moncalieri, Italy, February 19. Talk 1: A gentle introduction to Bayesian Nonparametrics. Talk 2: Species sampling models.
- MCMSki V, Lenzerheide, Switzerland, January 5-7. Invited talk: A moment-matching Ferguson & Klass algorithm.

Emeline Perthame has been invited to give a talk at:

- the statistics seminar at University of Caen in October 2016 on an *Inverse regression approach to robust non-linear high-to-low dimensional mapping*.

Gildas Mazo has been invited to give a talk at:

- a special session on Copulas at the ERCIM CFE-CMStatistics conference, December 2016, in Seville, Spain.

Alexis Arnaud gave a talk at:

- a GdR ISIS meeting on *Méthodes d'apprentissage statistiques et applications à la santé* 2016-10-21, Telecom Paris, on Automatic segmentation and characterization of brain tumors using robust multivariate clustering of multiparametric MRI.

10.1.5. Leadership within the Scientific Community

Stéphane Girard is at the head of the associate team (*Statistical Inference for the Management of Extreme Risks and Global Epidemiology*) created in 2015 between IISTIS and LERSTAD (Université Gaston Berger, Saint-Louis, Sénégal). The team is part of the LIRIMA (Laboratoire International de Recherche en Informatique et Mathématiques Appliquées), <http://mistis.inrialpes.fr/simerge>.

10.1.6. Scientific Expertise

- Stéphane Girard was in charge of evaluating research projects for the Research Foundation Flanders (FWO), Belgium.
- Stéphane Girard is a Voting Member for the International Society for NonParametric Statistics (ISNPS).

10.1.7. Research Administration

- Stéphane Girard has been at the head of the Probability and Statistics department of the LJK (Laboratoire Jean Kuntzmann) from September 2012 to September 2016.
- Grenoble Pole Cognition. F. Forbes is representing Inria and LJK in the pole.
- PRIMES Labex, Lyon. F. Forbes is a member of the strategic committee. F. Forbes is representing Inria.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Master : Stéphane Girard, *Statistique Inférentielle Avancée*, 41 ETD, M1 level, Ensimag. Grenoble-INP, France.

Master : Stéphane Girard, *Introduction à la statistique des valeurs extrêmes*, 15 ETD, M2 level, Université Gaston Berger, Saint-Louis, Sénégal.

Licence : Alexis Arnaud, *Probability and statistics*, 56 ETD, L2 level, IUT2 Grenoble, Université Pierre Mendès France.

Master: Jean-Baptiste Durand, *Statistics and probability*, 192 ETD, M1 and M2 levels, Ensimag Grenoble INP, France. Head of the MSIAM M2 programme, in charge of the statistics and data science tracks ([12]).

J.-B. Durand is a faculty member at Ensimag, Grenoble INP.

J.-M. Becu, C. Albert, B. Olivier are teaching at UGA.

Master and PhD course: Julyan Arbel gave a course on Bayesian statistics, 30 ETD, Collegio Carlo Alberto, Moncalieri, Turin, Italy.

10.2.2. Supervision

Aina Frau-Pascual, “*Statistical models for the analysis of ASL and BOLD functional magnetic resonance modalities to study brain function and disease*”, defended on December 19, 2016, Université Grenoble-Alpes, supervised by Florence Forbes and Philippe Ciuciu (CEA, Inria PARIETAL).

Seydou Nourou Sylla, “*Modélisation et classification de données binaires en grande dimension - Application à l'autopsie verbale*”, defended on December 21, 2016, Université Gaston Berger, Saint-Louis, Sénégal, supervised by Abdou Diongue (Université Gaston Berger, Sénégal) and Stéphane Girard.

Alessandro Chiancone, “*Réduction de dimension via Sliced Inverse Regression: Idées et nouvelles propositions*”, defended on October 28, 2016, Université Grenoble-Alpes, supervised by Stéphane Girard and Jocelyn Chanussot (Grenoble INP).

PhD in progress: Thibaud Rahier, “*Data-mining pour la fusion de données structurées et non-structurées*”, started on November 2015, Florence Forbes and Stéphane Girard.

PhD in progress: Clément Albert, “*Limites de crédibilité d'extrapolation des lois de valeurs extrêmes*”, started on January 2016, Stéphane Girard.

PhD in progress: Maïlys Lopes, “*Téledétection en écologie du paysage : statistiques en grande dimension pour la multirésolution spatiale et la haute résolution temporelle*”, started on November 2014, Stéphane Girard and Mathieu Fauvel (INRA Toulouse).

PhD in progress: Alexis Arnaud “*Multiparametric MRI statistical analysis for the identification and follow-up of brain tumors*”, October 2014, Florence Forbes and Emmanuel Barbier (GIN).

PhD in progress: Pierre-Antoine Rodesch, “*Spectral tomography and tomographic reconstruction algorithms*”, October 2015, Florence Forbes and Veronique Rebuffel (CEA Grenoble).

PhD in progress: Brice Olivier, “*Joint analysis of eye-movements and EEGs using coupled hidden Markov and topic models*”, October 2015, Jean-Baptiste Durand, Marianne Clausel and Anne Guérin-Dugué (Université Grenoble Alpes).

10.2.3. Juries

10.2.3.1. PhD

- Stéphane Girard has been reviewer of three PhD theses in 2016:
 - Cees de Valk, “*A large deviation approach to the statistics of extreme events*”, Tilburg University, Netherlands, December 2016.
 - Nicolas Goix, “*Apprentissage automatique et extrêmes et pour la détection d'anomalies*”, Telecom ParisTech, november 2016.
 - Anthony Zullo, “*Analyse de données fonctionnelles en téledétection hyperspectrale : application à l'étude des paysages agri-forestiers*”, Univ. Toulouse, September 2016.
- S. Girard was a member of two PhD committees in 2016:
 - Quentin Sebille, “*Modélisation spatiale de valeurs extrêmes, application à l'étude de précipitations en France*”, Univ. Lyon, december 2016.
 - Khalil Said, “*Mesures de risque multivariées et applications en science actuarielle*”, Univ. Lyon, december 2016.
- Florence Forbes has been reviewer of 1 PhD thesis in 2016:
 - Hong Phuong Dang, December 1st, 2016, Centrale Lille.

- F. Forbes was a member of one PhD committee in 2016:
 - Mohanad Albughdadi, September 2016, ENSHEEIT, Toulouse.

10.2.3.2. HDR

S. Girard was a member of the HDR committee of Mathieu Ribatet, Univ. Montpellier, November 2016.

F. Forbes was in the HDR committee of Sophie Achard, Univ. Grenoble Alpes, May 2016.

10.2.3.3. Other committees

- S. Girard is a member of the "Comité des Emplois Scientifiques" at Inria Grenoble Rhône-Alpes since 2015.
- F. Forbes is a member of the Committee for technological project and engineer candidate selection at Inria Grenoble Rhône-Alpes ("Commission du développement technologique ") since 2015.
- Since 2015, S. Girard is a member of the INRA committee (CSS MBIA) in charge of evaluating INRA researchers once a year in the MBIA dept of INRA.
- F. Forbes has been a member of 2 selection committees for Professors at Centrale-Supelec and Centrale Nantes and 1 selection committee for Assistant Professor at Paris-Sud University.

10.3. Popularization

- S. Girard presented his research on extreme-value analysis at the "Conférence ISN et enseignement", March 2016, [video](#). He also gave a talk at the Institut de Maitrise des Risques (IMdR) [38] on a similar topic.
- Julyan Arbel led the Math en Jeans teams at Lycée français Jean Giono, Turin, working on various subjects spanning from statistics, machine learning, to combinatorics and games.

MODAL Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

Christophe Biernacki co-organised a one-day meeting “Introduction aux modèles statistiques scalables: Modélisation, nouveaux paradigmes, écosystème Big Data” on December 5th 2016 at IHP (Paris). The website is here <https://bigdata-stat.sciencesconf.org/> and it brought together about 40 registered people (maximum number for this session).

Christophe Biernacki, Benjamin Guedj and Sophie Dabo-Niang were in the organizing committee of the workshop “Big Data: Modelling, Estimation and Selection” at École Centrale de Lille on June 9th and 10th 2016 (<https://indico.math.cnrs.fr/event/830/>).

Alain Celisse and Guillemette Marot co-organized SMPGD in Lille: The Statistical Methods for Post Genomic Data workshop is an annual meeting dedicated to statistical methods for post genomic data analysis. The aim of the workshop is to present works from mathematical to applied Statistics, but also new areas in high throughput Biology that could need new statistical developments. The workshop is usually organized around 3 to 4 invited speakers, and 3 to 4 invited sessions, and one session of contributed abstracts (oral presentations and posters). As SMPGD is especially interested in the statistical, mathematical, algorithmics or modelling questions raised by modern biology, presentations are expected to focus on these points.

Benjamin Guedj co-founded and co-organised a one-day workshop called **Young Statisticians and Probabilists (YSP)**, in Paris in January 2016. The topics were sequential learning, random trees, random maps and random matrices theory. Nearly 80 PhD students, postdocs and young researchers attended.

Benjamin Guedj is the organizer of the **Modal team scientific seminar**.

10.1.1.2. Member of the Organizing Committees

Benjamin Guedj has been a member of the steering committee for the FEM (**Forum Emploi Maths**) in Paris in December 2016. The FEM is the largest mathematics jobs fair in France and gathers universities, students, graduates, companies and institutions. Over 2,000 people attended this edition.

Sophie Dabo-Niang has been a member of the steering committees for the following events.

- CIMPA Research School: "Statistical methods for evaluation of extreme risks": April, 5-15, 2016, St-Louis, Senegal
- Workshop: "Financial and actuarial Mathematics": July 11-15, 2016, AIMS-Mbour, Senegal
- The first AWMA (African Women in Mathematics Association) regional Forum, July 8-9, 2016, AIMS-Mbour, Senegal
- Session "EO075: Quantile regression models for dependent data ", "The 9th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2016)" ([Link](#)), December 9-11, 2016, Seville, Spain.
- Session "Asymptotic properties in nonparametric spatial problems ", "Third conference of the International Society for NonParametric Statistics (ISNPS)", June, 11-16, 2016, Avignon, France.
- Workshop "Statistical methods for recurrent data ", November 7th, 2016, [Link](#).
- Workshop, "Learning with functional data", October, 7th, 2016, Lille, France. [Link](#)

Cristian Preda has co-organized the International Workshop on Applied Probability 2016 ([Link](#)).

Vincent Vandewalle is a member of the animation team of the bilille platform (<https://wikis.univ-lille1.fr/bilille/animation>). He has co-organized two scientific days, one in June 2016 on metagenomic analysis and another one in November 2016 on systems biology.

Serge Iovleff, Cristian Preda and Vincent Vandewalle have organised a one day workshop at Lille in October 2016 about learning with functional data. During this workshop, a large scope of methods for learning with functional data with application to various domains has been presented (<https://functional-data.univ-lille1.fr>).

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

Sophie Dabo-Niang has been a member of the scientific committees of two conferences:

- STAHY 2016 Workshop, September 26-27, Quebec, Canada.
- International colloquium on financial Econometrics, November -19, 2016, Rabat, Maroc. [Link](#)

10.1.2.2. Reviewer

Alain Celisse has acted as a reviewer for [AISTATS 2016](#).

Benjamin Guedj has acted as a reviewer for [NIPS 2016](#) and [AISTATS 2017](#).

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

Cristian Preda is a member of the editorial boards of

- Methodology and Computing in Applied Probability (Associate Editor)
- Romanian Journal of Mathematics and Computer Science" (Associate Editor)

Christophe Biernacki is an Associate Editor of the North-Western European Journal of Mathematics (NWEJM).

Sophie Dabo-Niang is a member of the editorial board of *Revista Colombiana de Estadística*.

10.1.3.2. Reviewer - Reviewing Activities

The Modal team is involved in 34 scientific outlets, among which are the most prestigious international journals related to statistics.

1. Advances in Data Analysis and Classification (Christophe Biernacki)
2. Annals of Applied Statistics (Sophie Dabo-Niang)
3. Annals of Statistics (Alain Celisse)
4. Bernoulli (Alain Celisse, Cristian Preda)
5. BMC Research Notes (Christophe Biernacki)
6. BMC Medical Research Methodology (Benjamin Guedj)
7. Canadian Journal of Statistics (Christophe Biernacki)
8. Chemometrics (Cristian Preda)
9. Computational Statistics and Data Analysis (Christophe Biernacki, Sophie Dabo-Niang, Cristian Preda, Vincent Vandewalle)
10. Data Mining and Knowledge Discovery (Christophe Biernacki)
11. Electronic Journal of Statistics (Alain Celisse, Sophie Dabo-Niang)
12. ESAIM: Probability and Statistics (Sophie Dabo-Niang)
13. Journal de la SFdS (Christophe Biernacki)
14. Journal of Classification (Christophe Biernacki)
15. Journal of Computational and Graphical Statistics (Vincent Vandewalle)
16. Journal of Machine Learning Research (Christophe Biernacki, Alain Celisse)

17. Journal of Multivariate Analysis (Sophie Dabo-Niang, Benjamin Guedj)
18. Journal of Nonparametric statistics (Sophie Dabo-Niang)
19. Journal of Statistical Planning and Inference (Christophe Biernacki)
20. Journal of Statistical Software (Christophe Biernacki)
21. Journal of the American Statistical Association (Benjamin Guedj)
22. Journal of the Royal Statistical Society, series A (Benjamin Guedj)
23. Knowledge and Information Systems (Christophe Biernacki)
24. Mathematical Reviews (Benjamin Guedj)
25. Methodology and Computing in Applied Probability (Cristian Preda)
26. Metrika (Sophie Dabo-Niang)
27. Molecular Ecology Resources (Benjamin Guedj)
28. Neurocomputing (Benjamin Guedj)
29. Statistical Inference for Stochastic Processes (Sophie Dabo-Niang)
30. Statistical Methods and Applications (Sophie Dabo-Niang)
31. Statistics (Sophie Dabo-Niang)
32. Statistics and Computing (Serge Iovleff)
33. Statistics and Probability Letters (Sophie Dabo-Niang, Benjamin Guedj)
34. The American Statistician (Christophe Biernacki)

10.1.4. Invited Talks

Christophe Biernacki's talks in 2016:

- Working Group on Model-Based Clustering Summer Session, Paris, July 17-23, 2016, <https://maths.ucd.ie/~brendan/wgmbc2016.html>, [28]
- Workshop on Model-based Clustering and Classification, September 5-7, 2016, Catania (Italy), <http://mbc2.unict.it/>, [29]
- Académie des Sciences, des Lettres et des Arts, Journée Scientifique "Big Data & Data Science", October 28th 2016, Tunis (Tunisia), <http://www.beitalhikma.tn/p7536/>, [26]
- 9th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2016, ERCIM 2016), 9-11 December 2016, University of Seville, Spain <http://cmstatistics.org/CMStatistics2016/>, [27]
- Talk to the seminar of the "Laboratoire de Mathématiques de Besançon", February 29th 2016

Sophie Dabo-Niang's talks in 2016:

- Environmental Econometrics Day, Spatial Risk estimation and Application to environmental data, April, 24, 2016, Rabat, Morocco.
- CRoNoS FDA, satellite workshop of Compstat2016 ([Link](#)), Functional Binary Choice Models With Choice-Based Sampling, August, 26-28, Oviedo, Spain.
- AAS/AMU symposium on "Current Research Trends in Mathematical Sciences and applications", May, 17-20, 2016, UNESCO Chair of Mathematics, National Mathematical Centre (NMC), Abuja Nigeria.
- Learning with functional data, Functional Binary Choice Models With Choice-Based Sampling, October, 7, 2016, Lille, France.

Benjamin Guedj has been invited to deliver a talk to the [48èmes Journées de Statistique](#) (JdS) of the [French Statistical Society](#) (June 2016, Montpellier, France).

Serge Iovleff gave a lightning talk entitled "MixAll: Un logiciel de classification non-supervisée" to the [5ème Rencontres R 2016](#).

Cristian Preda's talks in 2016:

1. International Workshop on Applied Probability (IWAP2016), 20-23 June, 2016, Toronto, Canada
2. 48e Journées de Statistique de la Société Française de Statistique, Montpellier, June 2016
3. 147th ICB Seminar Tenth International Seminar on statistics and clinical practice, May 15 - 18, 2016, Warsaw, Poland
4. 19-th Conference of the Romanian Society of Statistics and Probability, Universitatea Tehnica de Constructii Bucuresti, 27 mai 2016

10.1.5. Leadership within the Scientific Community

Christophe Biernacki is the president (since 2012) of the data mining and learning group of the French statistical association (SFdS, <http://www.sfds.asso.fr/>).

Benjamin Guedj is the president (since 2016) of the **Young Statisticians group** of the **French Statistical Society**.

Benjamin Guedj has joined the board of **AMIES**, the French Agency fostering collaborations between mathematicians and the private sector.

Guillemette Marot is responsible of bilille, the bioinformatics and bioanalysis platform of Lille. More information about the platform is available at <https://wikis.univ-lille1.fr/bilille/>

10.1.6. Scientific Expertise

Christophe Biernacki acted as an expert for two HCERES committees: one for teaching evaluation, one for research evaluation. He is also an elected member to the "Conseil National des Universités" (CNU) since October 2015.

Sophie Dabo-Niang offers expertise for Oreal's Award "Women in Science" since 2014.

10.1.7. Research Administration

Christophe Biernacki was "Délégué Scientifique Adjoint" of the Inria Lille center until June 2016. He is still member of the "Bureau du Comité des Projets" (BCP) of the Inria Lille center.

Sophie Dabo-Niang is the head of the MeQAME research team of Laboratory LEM-CNRS 9221.

Benjamin Guedj is a member of the scientific Council of the **Laboratoire Paul Painlevé** (maths department of the University of Lille).

Cristian Preda is a member of the Research Council of the University Lille 1.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Christophe Biernacki is the head of the M2 "Ingénierie Statistique et Numérique" <http://mathematiques.univ-lille1.fr/Formation/> at University Lille 1.

Serge Iovleff is responsible for the Computer Science Licence semester.

Licence: Sophie Dabo-Niang, Probability, 24h, Lille 3, France

Licence: Serge Iovleff, Discrete Mathematics, 68H, Computer Science, IUT, Lille 1, France

Licence: Serge Iovleff, Linear Algebra 24H, Computer Science, IUT, Lille 1, France

Licence: Serge Iovleff, Analysis and Numerical Methods, 75H, Computer Science, IUT, Lille 1, France

Licence: Serge Iovleff, Graphs and languages, 36H, Computer Science, IUT, Lille 1, France

Licence: Serge Iovleff, Mathematical Modélisation, 38H, Computer Science, IUT, Lille 1, France

Licence: Serge Iovleff, Internships supervision, 15H, Computer Science, IUT, Lille 1, France

Licence: Serge Iovleff, Operational Research, 14H, Computer Science, IUT, Lille 1, France

Licence: Guillemette Marot, Biostatistics, 9h, L1, U. Lille Droit et Santé, France
 Licence: Cristian Preda, Probability, 40h, L1, Polytech'Lille, France
 Licence: Cristian Preda, Inferential Statistics, 50h, L1, Polytech'Lille, France
 Licence: Vincent Vandewalle, Probability, 132h, L2, U. Lille 2, France
 Licence: Vincent Vandewalle, Classification, 32h, L2, U. Lille 2, France
 Licence: Vincent Vandewalle, Analysis, 24h, L2, U. Lille 2, France
 Licence: Vincent Vandewalle, Machine Learning, 20h, L3, U. Lille 2, France
 Master: Christophe Biernacki, coaching project, 10h, M1, U. Lille 1, France
 Master: Christophe Biernacki, data analysis, 97.5h, M2, U. Lille 1, France
 Master: Christophe Biernacki, coaching internship, 20h, M2, U. Lille 1, France
 Master: Sophie Dabo-Niang, Advanced Statistics, 24h, Lille 3, France
 Master: Sophie Dabo-Niang, Biostatistics Statistics, 40h, Master, Lille 1, France
 Master: Sophie Dabo-Niang, Non-parametric Statistics, 24h, Master, UGB, Senegal
 Master: Sophie Dabo-Niang, Spatial Statistics, 24h, Lille 3, France
 Master: Benjamin Guedj, Statistical Learning: Theory and Algorithms, 18h, Lille 1, France
 Master: Benjamin Guedj, Statistical Learning: Theory and Algorithms, 24h, Université Pierre & Marie Curie, France
 Master: Benjamin Guedj, Statistical Learning: Theory and Algorithms, 30h, Institut de Statistique des Universités de Paris (ISUP), France
 Master: Serge Iovleff, Object Oriented programming, 20H, Master Mathématiques Appliquées, Statistique - Ingénierie Mathématique, Lille 1, France
 Master: Serge Iovleff, Probability and stochastic processes, AIMS (MBour-Sénégal)
 Master: Guillemette Marot, Biostatistics, 44h, M1, U. Lille Droit et Santé, France
 Master: Guillemette Marot, Coaching project, 12h, M1, U. Lille Droit et Santé, France
 Master: Guillemette Marot, Supervised classification, 13h, M1, Polytech'Lille, France
 Master: Cristian Preda, Data Analysis, 40h, M1, Polytech'Lille, France
 Master: Cristian Preda, Biostatistics, 12h, M2, Polytech'Lille, France
 Master: Vincent Vandewalle, Classification 60h, M1, U. Lille 1, France
 Doctorat: Guillemette Marot, Data Analysis with R, 14h, U. Lille Droit et Santé, France

10.2.2. Supervision

PhD: Jérémie Kellner, "Gaussian processes and kernel methods", Université Lille 1, 12/2016, Alain Celisse.
 PhD: Quentin Grimonprez, "Variable selection in high dimensional setting with correlation", Inria DGA & Université Lille 1, 12/2016, Guillemette Marot, Julien Jacques, Alain Celisse.
 PHD: Florence Loingeville, "Modèle linéaire généralisé hiérarchique Gamma-Poisson pour le contrôle de qualité en microbiologie", Université Lille 1, 01/2016, Cristian Preda.
 PhD: Mohamed Yayaha, Lille 3, Sophie Dabo-Niang and Aboubacar Amiri.
 PhD: Aladji Bassene, Lille 3 & UGB (Sénégal), Sophie Dabo-Niang.
 PhD in progress: Le Li, "PAC-Bayesian Online Clustering: theory and algorithms", iAdvize & Université d'Angers, 11/2014, Benjamin Guedj, Sébastien Loustau.
 PhD in progress: Maxime Baelde, "Identification, localisation, séparation temps réel de sources sonores dans les flux audio multi-canaux", A-Volute, Inria & Université Lille 1, 01/2016, Christophe Biernacki.

PhD in progress: Anne-Lise Bedenel, "Appariement de descripteurs évoluant dans le temps", PIXEO, Inria & Université Lille 1, 06/2015, Christophe Biernacki, Laetitia Jourdan.

PhD in progress: Adrien Ehrhardt, "Modèles prédictifs pour données volumineuses et biaisées. Application à l'amélioration du scoring en risque crédit", CACF, Inria & Université Lille 1, 06/2016, Christophe Biernacki, Philippe Heinrich, Vincent Vandewalle.

PhD in progress: Maxime Brunin, "Early stopping rules in statistical learning", 09/2014, Christophe Biernacki, Alain Celisse.

PhD in progress: Emad Drwesh, Lille 3, Sophie Dabo-Niang, Jérôme Foncel.

PhD in progress: Mohamed Salem Ahmed, Lille 3, Sophie Dabo-Niang and Mohamed Attouch.

PhD in progress: H. Sarter, "Outils statistiques pour la sélection de variables et l'intégration de données cliniques et omiques : développement et application au registre EPIMAD", 12/2016, C. Gower, Guillemette Marot.

10.2.3. Juries

Christophe Biernacki participated as a reviewer to 5 PhD theses and 1 HdR committee, and as an examiner to 1 PhD thesis and 2 HdR committees. He also participated to 1 recruitment committee for a professor and was president of 1 recruitment committee for an assistant professor.

Alain Celisse has participated as an examiner to 1 PhD thesis.

Sophie Dabo-Niang has participated as an examiner to 4 PhD thesis.

Guillemette Marot was a member of two recruitment committees (MCU Univ. Nice, IE Univ. Lille). She was also an examiner to 1 PhD thesis.

Cristian Preda has participated as an examiner to 1 HdR committee.

Vincent Vandewalle has participated as an examiner to 1 PhD thesis.

10.3. Popularization

Christophe Biernacki has given about 10 talks during 2016 for institutions (Inria, universities, Ecole des Mines), companies and other related events. He gave also presentations towards students and industrials to the Xperium platform of the University of Lille about "Intelligence des données" (<https://modal.lille.inria.fr/xperium/>, <http://learningcenters.nordpasdecalais.fr/innovation/fr/xperium>). About 1,500 people came to this event during two years. He organized also a first short meeting in April 2016 in Lille for obtaining a feedback from company and academic users about the MASSICCC platform developed by the Modal and Select teams (<https://massiccc.lille.inria.fr/#/>). Here is the link towards this event: https://modal.lille.inria.fr/wikimodal/lib/exe/fetch.php?media=meeting_massiccc_7avril2016.pdf.

Sophie Dabo-Niang participates in the promotion of research among young children around a day of "Girls and Science, a light equation" organized in Lille (October 2016) and Senegal (Dakar, march 2016).

Benjamin Guedj has given a talk to high school students ("Terminale ISN") at Euratechnologies. The talk consisted in an overview of machine learning impacts our everyday lives and how mathematicians contribute to learning in the big data era.

Vincent Vandewalle has given one presentation towards students to the Xperium platform of the University of Lille about "Intelligence des données" (<https://modal.lille.inria.fr/xperium/>, <http://learningcenters.nordpasdecalais.fr/innovation/fr/xperium>). He also has animated a formation on probabilities and statistics for middle School mathematics teachers through the Maison Pour la Science (<http://www.maisons-pour-la-science.org/node/10641>).

REALOPT Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. Member of the Organizing Committees

- Pierre Pesneau has organized the workshop “Polyhedral Approaches for Combinatorial Optimization”, December 8-9 2016, Paris
- Arnaud Pêcher has organized the workshop “Bordeaux Graph Workshop”, Novembre 7-10 2016, Bordeaux.

10.1.2. Scientific Events Selection

10.1.2.1. Chair of Conference Program Committees

- Lionel Eyraud-Dubois is Chair of the “Cloud Computing and Data Center Management” track of I-SPAN 2017: the 14th International Symposium on Pervasive Systems, Algorithms, and Networks
- Olivier Beaumont is Co-Chair of the Algorithms track of ICPP 2016: 2016 International Conference on Parallel Processing

10.1.2.2. Member of the Conference Program Committees

The team members are members of the following program committees:

- François Clautiaux: ROADEF 2016: French Operational Research Society Conference.
- Lionel Eyraud-Dubois: ICPP 2016: 2016 International Conference on Parallel Processing
- Lionel Eyraud-Dubois and Olivier Beaumont: HiPC 2016: 23rd IEEE International Conference on High Performance Computing, Data, and Analytics
- Olivier Beaumont: IPDPS 2016, 30th IEEE International Parallel & Distributed Processing Symposium
- Olivier Beaumont: Euro-EDUPAR 2016, Parallel and Distributed Computing Education for Undergraduate Students, a EuroPar workshop
- Olivier Beaumont: HeteroPar 2016: Algorithms, Models, and Tools for Parallel Computing on Heterogeneous Platforms, a EuroPar Workshop

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- Olivier Beaumont is editor for IEEE Transactions on Parallel and Distributed Systems (TPDS)
- François Vanderbeck is Associate Editor for the EURO Journal on Computational Optimization
- François Clautiaux is Associate Editor for Mathematical Programming and Exact Methods in the journal ISTE “Recherche Opérationnelle”

10.1.3.2. Reviewer - Reviewing Activities

The team members are regular referees for the best journals of the field.

10.1.4. Invited Talks

Arnaud Pêcher: *On sets avoiding distance 1*, 2016 International Conference on Graph Theory, Jinhua, Chine, 2016

10.1.5. Scientific Expertise

- Olivier Beaumont is a member of the **INCITE (math-comp track) panel**
- Olivier Beaumont is an expert for the H2020-FET-OPEN-2016 projects

10.1.6. Research Administration

- Olivier Beaumont is the scientific deputy of Inria Bordeaux Sud-Ouest and a member of the Evaluation Committee of Inria.
- François Vanderbeck is taking care of the team OptimAI (“Optimisation Mathématique Modèle Aléatoire et Statistique”) at the Mathematics Institute of Bordeaux.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Licence : A. Pêcher, Programmation Impérative, 10h, DUT, Université de Bordeaux, France
 Licence : A. Pêcher, Conception Objet, 42h, DUT, Université de Bordeaux, France
 Licence : A. Pêcher, Programmation objet en Java, 44h, DUT, Université de Bordeaux, France
 Licence : A. Pêcher, Algorithmique Avancée, 32h, DUT, Université de Bordeaux, France
 Licence : A. Pêcher, Assembleur, 24h, DUT, Université de Bordeaux, France
 Licence : A. Pêcher, Programmation Mobile, 24h, DUT, Université de Bordeaux, France
 Master : F. Clautiaux, Gestion des Opérations et Planification de la Production, 20h, M2, Université de Bordeaux, France
 Master : F. Clautiaux, Flot et Combinatoire, 10h, M2, Institut Polytechniques de Bordeaux, France
 Master : F. Clautiaux, Introduction à la Programmation en Variables Entières, 20h, M1, Université de Bordeaux, France
 Master : F. Clautiaux, Projet d’optimisation pour l’insertion professionnelle, M2, Université de Bordeaux, France
 Master : L. Eyraud-Dubois, Optimisation en Cloud Computing et Big Data, 15h, M2, Université de Bordeaux, France
 Master : L. Eyraud-Dubois, Algorithmique et Programmation, 30h, M1, Université de Bordeaux, France
 Master : L. Eyraud-Dubois, Introduction à la Programmation en Variables Entières, 15h, M1, Université de Bordeaux, France
 Licence : P. Pesneau, Modèles et Méthodes d’Optimisation, 30h, L2, Université de Bordeaux, France
 Licence : P. Pesneau, Système et programmation en Fortran 90, 24h, L2, Université de Bordeaux, France
 Licence : P. Pesneau, Recherche Opérationnelle, 24h, DUT, Université de Bordeaux, France
 Master : P. Pesneau, Algorithmique et Programmation 1, 60h, M1, Université de Bordeaux, France
 Master : P. Pesneau, Algorithmique et Programmation 2, 30h, M1, Université de Bordeaux, France
 Master : P. Pesneau, Programmation linéaire, 15h, M1, Université de Bordeaux, France
 Master : P. Pesneau, Optimisation dans les graphes (partie flots), 15h, M1, Université de Bordeaux, France

Master : O. Beaumont, Approximation et Big Data, 15h, M2, Université de Bordeaux, France
 Master : O. Beaumont, Distributed Computing and Data Mining, 4h, M2, Institut National Polytechnique de Bordeaux, France
 Master : B. Detienne, Optimisation continue, 29h, M1, Université de Bordeaux, France
 Master : B. Detienne, Recherche Opérationnelle, 16h, M1, Institut National Polytechnique de Bordeaux, France
 Master : B. Detienne, Introduction à la Programmation en Variables Entières, 14h, M1, Université de Bordeaux, France
 Master : B. Detienne, Gestion des Opérations et Planification de la Production, 28h, M2, Université de Bordeaux, France
 Master : B. Detienne, Optimisation dans l'incertain, 58h, M2, Université de Bordeaux, France
 Master : B. Detienne, Problèmes combinatoires et routage, 14h, M1, Université de Bordeaux, France
 Master : I. Tahiri, Outils et Logiciels pour l'Optimisation, 30h, M1, Université de Bordeaux, France
 Master : F. Vanderbeck, Recherche Opérationnelle, 15h, M1, Institut National Polytechnique de Bordeaux, France
 Master : F. Vanderbeck, Programmation Entière, 58h, M2, Université de Bordeaux, France

10.2.2. Supervision

PhD in progress : Jérémy Guillot, Optimisation de problèmes de partitionnement, September 2014, François Clautiaux (dir) and Pierre Pesneau (dir).
 PhD in progress : Quentin Viaud, Méthodes de programmation mathématiques pour des problèmes complexes de découpe, January 2015, François Clautiaux (dir), Ruslan Sadykov (dir), and François Vanderbeck (co-dir).
 PhD in progress : Martin Bué, Gestion du revenu dans le cadre du voyage professionnel, September 2012, François Clautiaux (dir), Luce Brotcorne (dir).
 PhD in progress : Rodolphe Griset, Robust planning in Electricity production, November 2015, Boris Detienne (dir) and François Vanderbeck (dir).
 PhD in progress : Imen Ben Mohamed, Location routing problems, October 2015, Walid Klibi (dir) and François Vanderbeck (dir).
 PhD in progress : Thomas Bellitto, Infinite graphs, September 2015, Arnaud Pêcher (dir) and Christine Bachoc (dir).
 PhD in progress : Philippe Moustrou, Codes, September 2014, Arnaud Pêcher (dir) and Christine Bachoc (dir).
 PhD in progress : Thomas Lambert, September 2014, Placement de tâches et réplique de fichiers sur plates-formes parallèles, Olivier Beaumont (dir) and Lionel Eyraud-Dubois (co-dir)
 PhD in progress : Suraj Kumar, December 2013, Scheduling of Dense Linear Algebra Kernels on Heterogeneous Resources, Olivier Beaumont (dir) and Lionel Eyraud-Dubois (co-dir)

10.2.3. Juries

- François Clautiaux: Evaluation (rapporteur) of the PhD thesis of Charly Lersteau (University Bretagne Sud)
- Ruslan Sadykov: Evaluation (examinateur) of the PhD thesis of Rian Gabriel Santos Pinheiro (University Federal Fluminense, Niteroi, Brazil), March 1st, 2016.

10.3. Popularization

François Clautiaux is a member of the board of AMIES, the French Agency for Interaction in Mathematics with Business and Society. AMIES is a national organization that aims to develop relations between academic research teams in mathematics and business, especially SMEs.

SELECT Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

Sylvain Arlot:

- Sylvain Arlot organized a workshop at IHES on statistics and learning in the Paris-Saclay area.
- Sylvain Arlot co-organized (with Francis Bach, Inria Paris, and Alain Celisse, Univ. Lille 1) a 2-day workshop at IHES about computational and statistical trade-offs in learning.

Jean-Michel Poggi:

- Organization Special Invited Session entitled “Advances in Random Forests”, 22nd International Conference on Computational Statistics, Oviedo, Spain, 23-26 August 2016.

9.1.1.2. Member of the Organizing Committees

Gilles Celeux is one of the co-organizers of the international working group on model-based clustering. This year the workshop took place in Paris.

Sylvain Arlot co-organized the 1st Junior Conference on Data Science and Engineering at Paris-Saclay (at LAL, Orsay).

9.1.2. Scientific Events Selection

9.1.2.1. Chair of Conference Program Committees

Jean-Michel Poggi was:

- President of the Scientific Programme Committee, ENBIS 2017, Naples, 10-14 June 2017

9.1.2.2. Member of the Conference Program Committees

Jean-Michel Poggi was:

- Member of the Scientific Committee of CESS 2016, Conference of European Statistics Stakeholders, Hungarian Academy of Sciences, Budapest, 20-21 October 2016
- Member of SPC ENBIS-2016, Sheffield, UK, 11-15 September 2016
- Member of the Scientific committee of the journées MAS 2016, Grenoble
- Member of SPC COMPSTAT 2016, 22nd International Conference on Computational Statistics, Oviedo, Spain, 23-26 August 2016.

9.1.3. Journal

9.1.3.1. Member of the Editorial Boards

Gilles Celeux is Editor-in-Chief of the *Journal de la SFdS*. He is Associate Editor of *Statistics and Computing*, *CSBIGS*.

Pascal Massart is Associate Editor of *Annals of Statistics*, *Confluentes Mathematici*, and *Foundations and Trends in Machine Learning*.

Jean-Michel Poggi is Associate Editor of *Journal of Statistical Software*, *Journal de la SFdS* and *CSBIGS*.

9.1.3.2. Reviewer - Reviewing Activities

The members of the team have reviewed numerous papers for numerous international journals.

9.1.4. Invited Talks

The members of the team have given many invited talks on their research in the course of 2016.

9.1.5. Leadership within the Scientific Community

Jean-Michel Poggi is:

- Vice-President ENBIS (European Network for Business and Industrial Statistics), 2015-18
- Vice-President FENStatS (Federation of European National Statistical Societies) since 2012
- Council Member of the ISI (2015-19)
- Member of the Board of Directors of the ERS of IASC (since 2014)

9.1.6. Scientific Expertise

Jean-Michel Poggi is member of the EMS Committee for Applied Mathematics (since 2014).

9.1.7. Research Administration

Jean-Michel Poggi is the president of ECAS (European Courses in Advanced Statistics) since 2015.

Sylvain Arlot coordinates (jointly with Marc Schoenauer, Inria Saclay) the math-STIC program of the Labex Mathématique Hadamard.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

SELECT members teach various courses at several different universities, and in particular the Master 2 “Mathématique de l’aléatoire” of Université Paris-Saclay.

9.2.2. Supervision

PhD in progress: Valérie Robert, 2013, Gilles Celeux and Christine Keribin

PhD in progress: Yann Vasseur, 2013, Gilles Celeux and Marie-Laure Martin-Magniette (URGV)

PhD in progress: Neska El Haouij, 2014, Jean-Michel Poggi and Meriem Jaïdane, Raja Ghozi (ENIT Tunisie) and Sylvie Sevestre-Ghalila (CEA LinkLab), Thesis ENITUPS

PhD in progress: Florence Ducros, 2015, Gilles Celeux and Patrick Pamphile

PhD in progress: Claire Bréchet, 2015, Pascal Massart

PhD in progress: Eddie Aamari, 2015, Pascal Massart and Frédéric Chazal

PhD in progress: Damien Garreau, 2016, Sylvain Arlot and Gérard Biau

PhD in progress: Guillaume Maillard, 2016, Sylvain Arlot and Matthieu Lerasle

PhD in progress: Jeanne Nguyen, 2015, Claire Lacour

PhD in progress: Benjamin Goehry, 2015, Pascal Massart and Jean-Michel Poggi

9.2.3. Juries

- Ph.D. Jérémy Bensadon: Sylvain Arlot (president)
- Ph.D. Gwenaëlle Mabon: Sylvain Arlot (member)
- Ph.D. Mokhtar Alaya: Sylvain Arlot (president)
- Ph.D. Marie-Liesse Cauwet: Sylvain Arlot (member)

SEQUEL Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. Member of the Organizing Committees

- C. Dimitrakakis, ICML Workshop on the theory and practice of differential privacy.
- Ph. Preux, “Big Data : Modelisation, Estimation and Selection”, June 2016, Villeneuve d’Ascq.

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

- Conference on Learning Theory (COLT)
- International Joint Conference on Artificial Intelligence (IJCAI)
- European Conference on Machine Learning (ECML)
- ICPRAM
- French conferences:
 - Extraction et Gestion de Connaissances (EGC),
 - Journées Francophones de Planification, Décision, Apprentissage (JFPDA),
 - Apprentissage Automatique et Fouille de Données & Société Française de Classification

10.1.2.2. Reviewer

- Thirtieth AAAI Conference on Artificial Intelligence (AAAI-16)
- Conference on Learning Theory (COLT 2016)
- European Workshop on Reinforcement Learning (EWRL 2016)
- European Conference on Machine Learning (ECML 2016)
- International Conference on Machine Learning (ICML 2016)
- Neural Information Processing Systems (NIPS 2016)
- International Joint Conference on Artificial Intelligence (IJCAI 2016)
- Conference on Autonomous Agents and Multia-Agent Systems (AAMAS 2016)
- International Conference on Artificial Intelligence and Statistics (AISTATS 2016)
- French conferences:
 - Extraction et Gestion de Connaissances (EGC),
 - Journées Francophones de Planification, Décision, Apprentissage (JFPDA),
 - conférence francophone sur l’Apprentissage Automatique (CAp),
 - Apprentissage Automatique et Fouille de Données & Société Française de Classification
 - Conférence Nationale d’Intelligence Artificielle (CNIA)

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- Journal of Games.
- Neurocomputing.
- Revue d’Intelligence Artificielle

10.1.3.2. Reviewer - Reviewing Activities

- Automatica
- Artificial Intelligence Journal
- Machine Learning Journal
- Journal of Artificial Intelligence Research
- Journal of Machine Learning Research
- AMS Mathematical Review
- IEEE Transaction on Signal Processing
- IEEE Tansaction on Cybernetics

10.1.4. Invited Talks

- R. Gaudel, *From Bandits to Recommender Systems*, Presented on September 29th, 2016 at ENSAI, Rennes, France
- R. Gaudel, *Recommendation as a sequential process*, Presented on December 12th, 2016 at CMLA Mathématiques Appliquées, Cachan, France
- E. Kaufmann, *The information complexity of best arm identification*, Multi-armed Bandit Workshop 2016 at STOR-i, Lancaster University, UK, January 2016.
- E. Kaufmann, *The information complexity of sequential resource allocation*, seminar of the Collegio Carlo Alberto, Turin, March 2016.
- E. Kaufmann, *Optimal Best Arm Identification with Fixed Confidence*, Workshop on Computational and Statistical Trade-offs in Learning , Institut des Hautes Etudes Scientifiques (Orsay), March 2016.
- E. Kaufmann, *The information complexity of sequential resource allocation*, Stalab seminar, University of Cambridge, UK, April 2016.
- E. Kaufmann, *Stratégies bayésiennes et fréquentistes dans un modèle de bandit*, 1er congrès de la Société Mathématique de France, Tours, June 2016.
- E. Kaufmann, *Stratégies bayésiennes et fréquentistes dans un modèle de bandit*, Journées MAS, Grenoble, August 2016.
- E. Kaufmann, *Revisiting the Exploration-Exploitation Tradeoff in Bandit Models*, Workshop on Optimization and Decision-Making in Uncertainty, Simons Institute, Berkeley, September 2016.
- A. Lazaric, *Spectral Methods for Learning in POMDPs*, University of Liège, Belgium, February 2016.
- A. Lazaric, *Spectral Methods for Learning in POMDPs*, CMLA Mathématiques Appliquées, Cachan, France, February 2016.
- A. Lazaric, *Incremental Kernel Regression with Ridge Leverage Score Sampling*, “Data Learning and Inference” (DALI), Sestri Levante, Italy, April 2016.
- A. Lazaric, *Optimism and Randomness in Linear Multi-armed Bandit*, “International Conference on Monte-Carlo Techniques”, July 2016.
- J. Mary, *Structured Bandits*, “University of Strasbourg”, May. 2016.
- J. Mary, *Tutorial on Deep Neural Networks*, “Journées Big Data”, by the Laboratoire Painlevé. Jun. 2016.
- J. Mary, *Machine Learning and AI*, “EDF Seminar”, Dec. 2016.
- O. Pietquin, *Closing the Interaction Loop with (Inverse) Reinforcement Learning*, Presented on November 15, 2016 at AWRL, Hamilton, New-Zealand
- O. Pietquin, *Challenges of End-to-End Spoken Dialogue Systems*, Presented on December 10, 2016 at FILM@NIPS Workshop, Barcelona, Spain

- O. Pietquin, *Keeping the Human in the Loop: Challenges for Machine Learning*, Presented on March 10, 2016 at Xerox Research Center in Europe, Grenoble, France
- M. Valko, *Spectral Methods for Learning in POMDPs*, University of Liège, Belgium, February 2016.
- M. Valko, *Where is Justin Bieber?*, Presented on September 22nd, 2016 at Comenius University in Bratislava, Slovakia (*FMFI 2016*)
- M. Valko, *Bandit learning*, Presented on September 15–19th, 2016 at Information technologies - Applications and Theory, at Tatranské Matliare, High Tatras, Slovakia (*ITAT 2016*)
- M. Valko, *Decision-making on graphs without graphs*, Presented on June 16-17th, 2016 at Graph-based Learning and Graph Mining workshop, at Inria Lille, France (*GBLGM 2016*)
- M. Valko, *Sequential learning on graphs with limited feedback*, Presented on May 11–13th, 2016 at Data Driven Approach to Networks and Language, at ENS Lyon, France (*NETSpringLyon 2016*)
- M. Valko, *Benefits of Graphs in Bandit Settings*, Presented on January 11–12th, 2016 at Multi-armed Bandit Workshop 2016 at STOR-i, Lancaster University, UK (*STOR-i 2016*)

10.1.5. Scientific Expertise

- Agence Nationale pour la Recherche (ANR)
- ANRT
- D2RT Ile de France
- Institut National de Recherche en Agronomie (INRA)
- Fonds National pour la Recherche Scientifique (FNRS), Belgium
- H2020 program
- A. Lizaric was a member of the hiring committee for junior researchers at Inria Lille (2016).
- M. Valko is an elected member of the evaluation committee and participates in the hiring, promotion, and evaluation juries of Inria, notably
 - Hiring committee for junior researchers at Inria Sophia Antipolis (2016)
 - Selection committee for Inria award for scientific excellence, junior and senior (2016)
 - Selection committee for CR promotions (2016)
- Ph. Preux has chaired the hiring committee for an associate professor position at Université de Lille 3
- J. Mary was webpage chair for ICML'2016 in NYC

10.1.6. Research Administration

- Philippe Preux is:
 - Délégué Scientifique Adjoint (DSA) at Inria Lille
 - member of the Evaluation Committee (CE) at Inria
 - member of the Project Committee Board (BCP, Bureau du Comité des Projets) at Inria Lille
 - head of the "Data Intelligence" (DatInG) thematic group at CRIStAL.
 - member of the Scientific Committee of CRIStAL.
- R. Gaudel is member of the board of CRIStAL.
- R. Gaudel is manager of proml mailing list. This mailing list gathers French-speaking researchers from Machine Learning community.
- J. Mary is member of the "Commission Développement Technologique" at Inria Lille.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- Licence: C. Dimitrakakis, C2i, 25h eqTD, L1-2, Université de Lille 3, France.
- Licence: C. Dimitrakakis, Traitement de données, Université de Lille 3, France.
- Licence: C. Dimitrakakis, Modélisation de bases de données, Université de Lille 3, France.
- Licence: C. Dimitrakakis, Fonctionnement des réseaux, Université de Lille 3, France.
- Master: A. Lazaric, Reinforcement Learning, 25h eqTD, M2, ENS Cachan, France
- Master: A. Lazaric, Reinforcement Learning, 25h eqTD, M2, Ecole Centrale Lille, France
- Master: Ph. Preux, Advanced data mining, 30h eqTD, M2, Université de Lille 3, France
- Master: Ph. Preux, Fundamental algorithms for data mining, 30h eqTD, M1, Université de Lille 3, France
- Licence: Ph. Preux, Neural Networks, 28h eqTD, L3, Université de Lille 3, France
- Licence: Ph. Preux, Graph Theory, 28h eqTD, L3, Université de Lille 3, France
- Licence: Ph. Preux, C2i, 25h eqTD, L1-2, Université de Lille 3, France.
- Master: M. Valko, 2016/2017 Fall: Graphs in Machine Learning, 27h eqTD, M2, ENS Cachan
- Licence: R. Gaudel, 2016/2017 Spring: programmation R pour statistiques et sociologie quantitative, 44h eqTD, L1, université Lille 3, France
- Licence: R. Gaudel, 2016/2017 Fall: préparation au C2i niveau 1, 30h eqTD, L1-3, université Lille 3, France
- Licence: R. Gaudel, 2016/2017 Spring: préparation au C2i niveau 1, 25h eqTD, L1-3, université Lille 3, France
- Licence: R. Gaudel, 2016/2017 Fall: travail collaboratif et à distance dans un monde numérique, 13h eqTD, L1-3 (enseignement à distance), université Lille 3, France
- Licence: R. Gaudel, 2016/2017 Fall: algorithmes fondamentaux de la fouille de données, 30h eqTD, M1, université Lille 3, France
- Licence: R. Gaudel, 2016/2017 Fall: Fouille de données avancée, 30h eqTD, M2, université Lille 3, France
- Master: B. Piot, 2016/2017 Spring: Web Design, 60h eqTD, M2, Univ. Lille, France
- Master: B. Piot, 2016/2017 Spring: Object Programming, 70h eqTD, M2, Univ. Lille, France
- Master: B. Piot, 2016/2017 Fall: Web Design, 30h eqTD, M2, Univ. Lille, France
- Master: B. Piot, 2016/2017 Fall: Object Programming, 22h eqTD, M2, Univ. Lille, France
- Master: B. Piot, 2016/2017 Fall: Databases, 30h eqTD, M1, Univ. Lille, France
- Master: J. Mary, 2016/2017 Fall: algorithmes fondamentaux de la fouille de données, 30h eqTD, M1, Univ. Lille, France
- Master: J. Mary, 2016/2017 Fall: Programmation Web Avancée, 30h eqTD, M2, Univ. Lille, France
- Master: J. Mary, 2016/2017 Fall: Reinforcement Learning, 16h eqTD, M2, Univ. Lille, France

10.2.2. Supervision

- HdR: Michal Valko, Bandits on graphs and structures, ENS-Cachan, June 15th, 2016
- PhD: Frédéric Guillou, On recommendation systems in sequential context, University of Lille, Dec. 2nd, 2016, advisors: Philippe Preux, Romaric Gaudel, Jérémie Mary
- PhD: Tomas Kocak, Apprentissage séquentiel avec similitudes, University of Lille, Nov. 28th, 2016, advisor: Michal Valko, Rémi Munos

PhD: Hadrien Glaude, Méthodes des moments pour l'inférence de systèmes séquentiels linéaires rationnels, University of Lille, July. 8th, 2016, advisor: Olivier Pietquin

PhD in progress: Pratik Gajane, Sequential Learning and Decision Making under Partial Monitoring, University of Lille, started Oct. 2014, advisor: Philippe Preux

PhD in progress: Marc Abeille, Randomized Exploration-exploration Strategies, University of Lille, started Oct. 2014, advisor: Alessandro Lazaric

PhD in progress: Merwan Barlier, Dialogues intelligents basés sur l'écoute de conversations homme/homme, University of Lille, started Oct. 2014, advisor: Olivier Pietquin

PhD in progress: Alexandre Berard, Learning from post-editing for machine translation, University of Lille, started Oct. 2014, advisor: Olivier Pietquin

PhD in progress: Lilian Besson, Apprentissage séquentiel multi-joueurs pour la radio intelligente, CentraleSupélec Rennes, started Oct. 2016, advisor: Emilie Kaufmann

PhD in progress: Reda Alami, Bandit à Mémoire pour la prise de décision en environnement dynamique, Orange LABS, University of Paris-Saclay, started Oct. 2016, advisor: Odalric-Ambrym Maillard, Raphaël Feraud

PhD in progress: Daniele Calandriello, Efficient Sequential Learning in Structured and Constrained Environment, Inria, started Oct. 2014, advisor: Michal Valko, Alessandro Lazaric

PhD in progress: Ronan Fruit, Transfer in Hierarchical Reinforcement Learning, University of Lille, started Dec. 2015, advisor: Alessandro Lazaric

PhD in progress: Guillaume Gautier, DPPs in ML, started Oct. 2016, advisor: Michal Valko; Rémi Bardenet

PhD in progress: Jean-Bastien Grill, Création et analyse d'algorithmes efficaces pour la prise de décision dans un environnement inconnu et incertain, Inria/ENS Paris/Lille 1, started Oct. 2014, advisor: Rémi Munos, Michal Valko

PhD in progress: Julien Perolat, Reinforcement learning: the 2-player case, University of Lille, started Oct. 2014, advisor: Olivier Pietquin, Bilal Piot

PhD in progress: Florian Strub, Deep sequential learning and its application to human-robot interaction, University of Lille, started Jan. 2016, advisor: Olivier Pietquin, Jérémie Mary

PhD in progress: Romain Warlop, Novel Learning and Exploration-Exploitation Methods for Effective Recommender Systems, University of Lille, started Sep. 2015, advisor: Jérémie Mary

PhD in progress: Aristide Tossou, Privacy in Sequential Decision Making (provisional), Chalmers, started Feb. 2015, advisor: Christos Dimitrakakis

10.2.3. Juries

PhD and hdr juries:

- E. Kaufmann: Marie-Liesse Cauwet, LRI, Orsay.
- A. Lazaric: Matteo Pirotta, Politecnico di Milano, Italy.
- J. Mary: examiner for Raphaël Puget, université Paris 6.
- J. Mary: reviewer for Robin Allesiardo, université Paris Saclay
- Ph. Preux: reviewer for Hongliang Zhong, Laboratoire d'Informatique Fondamentale, Marseille
- Ph. Preux: president of the defense jury of the HDR of Matthieu Geist, Université de Lille
- O. Pietquin: advisor of the HDR of Matthieu Gestit, Université de Lille
- O. Pietquin: Hatim Khouzami, University of Avignon

PhD mid-term evaluation:

- A. Lazaric: Claire Vernade (mid-term evaluation), Telecom ParisTech, France.
- E. Kaufmann: opponent for the licenciate thesis of Stefan Magureanu, KTH, Stockholm, Sweden.

10.3. Popularization

- A. Lazaric was interviewed for Inria-Lille magazine (December issue).
- J. Mary gave a 55 min talk in front of students of Lycée Sainte-Famille at Amiens.
- Ph. Preux gave 2 talks on “Artificial Intelligence” in a high-school in Villeneuve d’Ascq within the “Fête de la science”.
- O. Pietquin was interviewed by France Culture (Supersonic) on March 23rd, 2016

SIERRA Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

Alexandre d'Aspremont: Workshop preparation for les Houches in Feb. 2016: "Optimization without borders", to celebrate Y. Nesterov's 60th birthday.

Francis Bach: organization of a workshop at IHES (with S. Arlot and A. Celisse), March 2016.

Francis Bach: co-organization of two NIPS workshops.

9.1.2. Scientific Events Selection

9.1.2.1. Member of the Conference Program Committees

Francis Bach: Area chair for ICML 2016

Simon Lacoste-Julien: Area chair for ICML 2016

Simon Lacoste-Julien: Area chair for NIPS 2016

9.1.3. Journal

9.1.3.1. Member of Editorial Boards

Alexandre d'Aspremont: Associate Editor, SIAM Journal on Optimization (2013-...).

F. Bach: Action Editor, Journal of Machine Learning Research.

F. Bach: Information and Inference, Associate Editor.

F. Bach: SIAM Journal on Imaging Sciences, Associate Editor.

F. Bach: Electronic Journal of Statistics, Associate Editor.

9.1.4. Invited Talks

Alexandre d'Aspremont: Regularized Nonlinear Acceleration, BIRS workshop, Oaxaca, October 2016.

Alexandre d'Aspremont: Optimal Affine Invariant Smooth Minimization Algorithms, Institut des hautes études scientifiques, June 2016.

Alexandre d'Aspremont: Optimal Affine Invariant Smooth Minimization Algorithms, Nexus of Information and Computation Theories, Institut Henri Poincaré, March 2016.

Alexandre d'Aspremont: Optimal Affine Invariant Smooth Minimization Algorithms, Workshop on Algorithms and Dynamics for Games and Optimization, Santiago Chile, January 2016.

Francis Bach: Winter School on Signal processing, Bonn, January 2016.

Francis Bach: "Optimization without borders", Les Houches, February 2016.

Francis Bach: Oberwolfach, March 2016.

Francis Bach: Dali meeting, Sestri Levante, Italy, March 2016.

Francis Bach: ETH Computer Science Colloquium, April 2016.

Francis Bach: Workshop San Servolo, May 2016.

Francis Bach: Machine Learning summer school Cadiz, May 2016.

Francis Bach: Summer school, Bangalore, July 2016.

Francis Bach: ICCOPT conference, plenary speaker, August 2016.

Francis Bach: Workshop, Haifa, Septembre 2016.

Francis Bach: Statistics Seminar, Cambridge, October 2016.

Francis Bach: BIRS Oaxaca, October 2016.

Francis Bach: NIPS workshops (three presentations), December 2016.

Damien Garreau: "Consistent multiple change-point detection with kernels", Group meeting of Geometrica Inria project team, Saclay (February 18, 2016).

Damien Garreau: "Consistent multiple change-point detection with kernels", Inria Junior Seminar, Paris (March 15, 2016).

Damien Garreau: "Consistent multiple change-point detection with kernels", Colloque final de l'ANR Calibration, Nice (April 7, 2016).

Damien Garreau: "Consistent multiple change-point detection with kernels", Colloque Jeunes probabilistes et Statisticiens, Les Houches (April 18, 2016).

Pascal Germain: "A Representation Learning Approach for Domain Adaptation", Tao Seminars, Université Paris-Sud, Paris, France, March 2016.

Pascal Germain: "A Representation Learning Approach for Domain Adaptation", Data Intelligence Group Seminars, Université Jean-Monnet, Saint-Étienne, France, March 2016.

Pascal Germain: "Variations on the PAC-Bayesian Bound", Bayes in Paris Seminar at ENSAE, Paris, France, June 2016.

Pascal Germain: "Variations on the PAC-Bayesian Bound", Séminaires du département d'informatique et de génie logiciel, Université Laval, Quebec, Canada, July 2016.

Simon Lacoste-Julien: "On the Global Linear Convergence of Frank-Wolfe Optimization Variants", invited talk in the Conic and Polynomial Optimization cluster at ICCOPT 2016, Tokyo, Japan, August 2016..

Simon Lacoste-Julien: "On the Global Linear Convergence of Frank-Wolfe Optimization Variants", invited talk in the Learning and Optimization workshop of DALI meeting, Sestri Levante, Italy, April 2016.

Simon Lacoste-Julien: "Modern Optimization for Structured Machine Learning", CS & OR Department Colloquium, Université de Montréal, Montreal, Canada, February 2016.

Antoine Recanatì: Presentation at the group meeting of Mines ParisTech Centre for Computational Biology (CBIO) at Institut Curie, October, 18th 2016.

9.1.5. Leadership within the Scientific Community

Alexandre d'Aspremont: Porteur de l'IRIS PSL "Science des données, données de la science".

Alexandre d'Aspremont: Co-scientific director of Master's program MASH (Mathématiques, Apprentissage et Sciences Humaines), with ENS - Paris Dauphine.

Alexandre d'Aspremont: Scientific committee, programme Gaspard Monge pour l'Optimisation.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Master: A. d'Aspremont, M1 course on Optimization: ENS Paris, 21h

Master: A. d'Aspremont, M2 course on Optimization: MVA, ENS Cachan, 21h

Master : F. Bach (together with J.-P. Vert), "Apprentissage statistique", 35h, M1, Ecole Normale Supérieure.

Master : F. Bach (together with G. Obozinski), "Graphical models", 30h, M2 (MVA), ENS Cachan.

Master : F. Bach , 20h, M2 (Mathématiques de l'aléatoire), Université Paris-Sud.

Mastere (M1): S. Lacoste-Julien, F. Vogel, “Projets informatiques”, 10h, Université de Paris-Dauphine, Master M2: Mathématiques, Apprentissage et Sciences Humaines (MASH)

Master : A. Osokin (together with K. Alahari), “The introduction to discrete optimization”, 30h, M2, Centrale Supélec

Master: Fabian Pedregosa, Machine learning with scikit-learn, Master Mathématiques, Apprentissage et Sciences Humaines (MASH), Paris Dauphine.

9.2.2. Supervision

PhD: Anastasia Podosinnikova, November 2016, co-advised by Francis Bach and Simon Lacoste-Julien

PhD: Thomas Schatz, September 2016, co-advised by and E. Dupoux (ENS, cognitive sciences).

PhD: Sesh Kumar, September 2016, advised by F. Bach.

PhD in progress : Nom du doctorant, titre (provisoire) du mémoire, date du début de la thèse, encadrant(s)

PhD in progress : Jean-Baptiste Alayrac, co-advised by Simon Lacoste-Julien, Josef Sivic and Ivan Laptev, started Sept. 2014.

PhD in progress : Rémi Leblond, advised by Simon Lacoste-Julien, started Sept. 2015.

PhD in progress : Gauthier Gidel, advised by Simon Lacoste-Julien, started Sept. 2016.

PhD in progress : Vincent Roulet, directed by Alexandre d’Aspremont, started as a PhD on Oct. 1 2014.

PhD in progress : Nicolas Flammarion, co-directed by Alexandre d’Aspremont and Francis Bach, started Sept. 2013.

PhD in progress : Damien Scieur, co-directed with Alexandre d’Aspremont and Francis Bach, started Sept. 2015.

PhD in progress : Antoine Recanati, directed by Alexandre d’Aspremont, started Sept. 2015.

PhD in progress: Rafael Rezende, September 2013, F. Bach, co-advised with J. Ponce.

PhD in progress: PhD in progress: Christophe Dupuy, January 2014, co-advised by F. Bach and C. Diot (Technicolor).

PhD in progress: Damien Garreau, September 2014, co-advised by S. Arlot and G. Biau.

PhD in progress: Anaël Bonneton, December 2014, co- advised by F. Bach, located in Agence nationale de la sécurité des systèmes d’information (ANSSI).

PhD in progress: Dmitry Babichev, September 2015, co-advised by F. Bach and A. Judistky (Univ. Grenoble).

PhD in progress: Tatiana Shpakova, September 2015, advised by F. Bach.

9.2.3. Juries

Alexandre d’Aspremont: PhD Committee for Igor Colin, Nov. 2016.

Francis Bach: PhD Committee for Alain Durmus, Dec. 2016.

TAO Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

Isabelle Guyon, Program Chair of NIPS 2016

10.1.1.2. Member of the Organizing Committees

- Anne Auger, co-organizer of the GECCO workshop on Black Box Optimization Benchmarking.
- Cécile Germain, Scientific Committee, DataScience@HEP 2016
- Nikolaus Hansen, co-organizer of the GECCO workshop on Black Box Optimization Benchmarking.
- Marc Schoenauer, Steering Committee, Parallel Problem Solving from Nature (PPSN); Steering Committee, Learning and Intelligent Optimization (LION).
- Michele Sebag, President of Steering Committee, Eur. Conf. on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD).
- Isabelle Guyon, co-organizer of two NIPS workshops (Challenges in Machine Learning and Spatio-temporal time series), co-organizer of AutoML workshop at ICML, co-organizer of LAP challenge workshops (ECCV, ICPR).
- Paola Tubaro, co-organizer of the Second European Social Networks (EUSN) Conference.

10.1.1.3. Member of Conference Program Committees

All TAO members are members of the Program Committees of the main conferences in the fields of Machine Learning, Evolutionary Computation, and Information Processing.

10.1.1.4. Reviewer

All TAO member review papers for the most prestigious journals in the fields of Machine Learning and Evolutionary Computation.

10.1.2. Journal

10.1.2.1. Member of the Editorial Boards

- Anne Auger, member of Editorial Board, *Evolutionary Computation Journal*, MIT Press.
- Gregory Grefenstette, member of Editorial Board, *Journal of Natural Language Engineering*, Cambridge University Press.
- Isabelle Guyon, action editor, *Journal of Machine Learning Research (JMLR)*.
- Isabelle Guyon, series editor, *Microtome book series Challenges in Machine Learning (CiML)*.
- Nikolaus Hansen, member of Editorial Board, *Evolutionary Computation Journal*, MIT Press.
- Marc Schoenauer, member of Advisory Board, *Evolutionary Computation Journal*, MIT Press; member of Editorial Board, *Genetic Programming and Evolutionary Machines*, Springer Verlag; action editor, *Journal of Machine Learning Research (JMLR)*.
- Michèle Sebag: Editorial Board, *Machine Learning*, Springer Verlag.
- Olivier Teytaud, action editor, *Journal of Machine Learning Research (JMLR)*.
- Paola Tubaro, member of Associate Editorial Board, *Sociology*, Sage; member of Editorial Board, *Revue Française de Sociologie*, Presses de Sciences Po.

10.1.2.2. Reviewer - Reviewing Activities

All members of the team reviewed numerous articles for international conferences and journals.

10.1.3. Invited Talks

- Isabelle Guyon. 17 Oct. ENS SMILE seminars. Network Reconstruction: the Contribution of Challenges in Machine Learning.
- Michele Sebag, 21 Jan., Deep Learning, IHP
- Michele Sebag, 24 Mar., Nutrition personnalisée et alimentation sur mesure, AgroParisTech.
- Michele Sebag, 12 Oct., Deep Learning and Artificial Intelligence, Franco-Japanese Symposium. Tokyo
- Paola Tubaro. 8 Mar. University of Insubria (Italy) economics department seminar. Investigating peer effects and performance similarity in organizational networks: a longitudinal study.
- Paola Tubaro. 15 Mar. EHESS seminar. Sociabilité et soutien social dans les communautés en ligne autour des troubles de l'alimentation.
- Paola Tubaro. 2 Nov. UQAM (Montréal), Seminar of the health communication research center (ComSante). Le phénomène 'pro ana' : Troubles alimentaires et réseaux sociaux.
- Paola Tubaro. 8 Nov. Université Laval (Québec), Seminar of the CELAT research center. Le phénomène 'pro ana' : Troubles alimentaires et réseaux sociaux.

10.1.4. Leadership within the scientific community

- Isabelle Guyon, President and co-founder of ChaLearn, a non-for-profit organization dedicated to the organization of challenge. <http://chalearn.org>
- Marc Schoenauer, elected Chair of ACM-SIGEVO (Special Interest Group on Evolutionary Computation), July 2015 (2-years term).
- Marc Schoenauer, founding President of SPECIES (Society for the Promotion of Evolutionary Computation In Europe and Surroundings), that organizes the yearly series of conferences *EvoStar*.
- Michèle Sebag, elected Chair of Steering Committee, ECML-PKDD; head of the Research Committee of Labex Digicosme.
- Paola Tubaro, convenor of the Social Network Analysis Group of British Sociological Association.

10.1.5. Scientific expertise

- Cécile Germain, evaluator for the H2020 calls: *ICT-2015 Topic ICT-16 – Big Data - research*
- Gregory Grefenstette, evaluator for FU21, Cap Digital, Digiteo (IASI) review board
- Gregory Grefenstette, project reviewer for the H2020 (SemCare): *Information and Communication Technologies ICT*
- Michele Sebag, evaluator for the Swedish Foundation for Strategic Research
- Michele Sebag, member of hiring jury for U. Nancy
- Paola Tubaro, evaluator for ANR, SNSF (Swiss National Science Foundation), and National Science Center (Poland).

10.1.6. Research administration

- Philippe Caillou, elected member of the Scientific Council and Academic Council.
- Cécile Germain, elected member of the U-PSUD Scientific Council and of its board. University officer for scientific computing. Deputy head of the computer science department, in charge of research, member of the Board of the Lidex *Center for Data Science*.
- Marc Schoenauer, *Délégué Scientifique* (aka VP-Research) for the Inria Saclay Île-de-France branch until June 2016; co-chair (with Sylvain Arlot) of the *Maths-STIC* program of the Labex of Mathematics Hadamard (LMH).
- Michele Sebag, deputy director of LRI, CNRS UMR 8623; elected member of the Research Council of Univ. Paris-Saclay; member of the STIC department council; member of the Board of the Lidexes *Institut de la Société Numérique* and *Center for Data Science*.

- Paola Tubaro, member of the steering team, MSH Paris-Saclay, axis 1 "Power of algorithms".

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Licence : Philippe Caillou, Computer Science for students in Accounting and Management, 192h, L1, IUT Sceaux, Univ. Paris Sud.

Licence : Aurélien Decelle, Computer Architecture, 60h, L2, Univ. Paris-Sud.

Licence : Aurélien Decelle, Machine Learning and Artificial Life, 55h, L2, Univ. Paris-Sud.

Licence : Aurélien Decelle, Computer Architecture, 41h, L3, Univ. Paris-Sud.

Licence and Polytech : Cécile Germain, Computer Architecture

Licence : Isabelle Guyon, Project: Creation of mini-challenges, M2, Univ. Paris-Sud.

Master : Anne Auger, Optimisation, 12h, M2 Recherche, U. Paris-sud.

Master : Guillaume Charpiat et Gaétan Marceau, Advanced Machine Learning, 34h, M2 Recherche, Centrale-Supélec.

Master : Aurélien Decelle, Machine Learning, 27h, M1, Univ. Paris-Sud.

Master : Aurélien Decelle, Information theory, 39h, M1, Univ. Paris-Sud.

Master : Cécile Germain, Parallel Programming

Master : Isabelle Guyon, Project: Resolution of mini-challenges (created by M2 students), L2, Univ. Paris-Sud.

Master : Odalric-Ambrym Maillard, Machine Learning, 6h, M2 Recherche, Univ. Paris-Sud

Master : Yann Ollivier, Deep learning, 4h, M2 Recherche, Telecom/Polytech.

Master : Michèle Sebag, Machine Learning, 12h; Deep Learning, 6h; Reinforcement Learning, 6h; M2 Recherche, U. Paris-sud.

Master : Paola Tubaro, Sociology of social networks, 24h, M2, EHESS/ENS/ENSAE.

Master : Paola Tubaro, Digital platforms, online socialization and new economic models, 6h, M2, Arts et Métiers ParisTech (ENSAM).

Doctorate: Paola Tubaro, Research Methods, 9h, University of Insubria, Italy.

10.2.2. Supervision

PhD: Jérémy BENSADON, *Applications of Information Theory to Statistical Learning*, Univ. Paris-Saclay, 02/02/2016, Yann Ollivier.

PhD: Marie-Liesse CAUWET, *Artificial intelligence with uncertainties, application to power systems*, Univ. Paris-Saclay, 30/9/2016, Olivier Teytaud.

PhD: Sandra ASTETE-MORALES, *Noisy optimization, with applications to power systems*, Univ. Paris-Saclay, 5/10/2016, Olivier Teytaud.

PhD: Robin ALLESIARDIO, *Multi-armed Bandits on non Stationary Data Streams*, Univ. Paris-Saclay, 19/10/2016, Raphaël Féraud (Orange Labs) and Michèle Sebag.

PhD in progress: Ouassim AIT ELHARA, *Large-scale optimization and Evolution Strategies*, 1/09/2012, Anne Auger and Nikolaus Hansen.

PhD in progress: Asma ATAMNA, *Evolution Strategies and Constrained Optimization*, 1/10/2013, Anne Auger and Nikolaus Hansen.

PhD in progress: Nacim BELKHIR, *On-line parameter tuning*, 1/5/2014, Marc Schoenauer and Johann Dréo (Thalès), CIFRE Thalès.

PhD in progress: Vincent BERTHIER, *Large scale parallel optimization, with application to power systems*, 1/09/2013, Michèle Sebag et Olivier Teytaud.

PhD in progress: Mehdi CHERTI *Learning to discover: supervised discrimination and unsupervised representation learning with applications in particle physics*. 01/10/2014, Balazs Kegl and Cécile Germain.

PhD in progress : Benjamin DONNOT, *Optimisation et méthodes d'apprentissage pour une conduite robuste et efficace du réseau électrique par anticipation sur base de paradigmes topologiques.*, 1/09/2015, Isabelle Guyon and Marc Schoenauer

PhD in progress : Guillaume DOQUET, *ML Algorithm Selection and Domain Adaptation*, 1/09/2015, Michele Sebag

PhD in progress: Victor ESTRADE *Robust domain-adversarial learning, with applications to High Energy Physics*, 01/10/2016, Cécile Germain and Isabelle Guyon.

PhD in progress: François GONARD, *Automatic optimization algorithm selection and configuration*, 1/10/2014, Marc Schoenauer and Michèle Sebag, thèse IRT SystemX.

PhD in progress : Hoang M. LUONG, *Squaring the Circle in Modelling Corporate Governance, Market Structure and Innovation: A Tobin's Q Approach to R&D Investment when Network Effects Are Present*, 01/09/2014, (with M. Ugur and S. Gorgoni, at the University of Greenwich, London, UK).

PhD in progress : Emmanuel MAGGIORI, *Large-Scale Remote Sensing Image Classification*, 1/1/2015, Guillaume Charpiat (with Yuliya Tarabalka and Pierre Alliez, Inria Sophia-Antipolis)

PhD in progress: Pierre-Yves MASSÉ, *Gradient Methods for Statistical Learning*, 1/10/2014, Yann Ollivier

PhD in progress: Sourava MISHRA, *AutoML: An empirical approach to Machine Learning*, 1/10/2014, Balazs Kégl and Michèle Sebag

PhD in progress : Anna PIAZZA, *Inter-Organisational Relationships and Organisational Performance: Network Analysis Applications to a Health Care System*, 01/09/2014, Paola Tubaro (with F. Pallotti and A. Lomi, at the University of Greenwich, London, UK).

PhD in progress: Adrian POL *Machine Learning Anomaly Detection, with application to CMS Data Quality Monitoring*, 01/10/2016, Cécile Germain.

PhD in progress: Karima RAFES *Gestion et sécurité des données personnelles dans le web des objets*. 01/10/2014, Serge Abiteboul and Cécile Germain.

PhD in progress : Yasaman SARABI, *Network Analysis of Private Water Companies, Challenges Collaboration and Competition*, 15/03/2012, Paola Tubaro (at the University of Greenwich, London, UK).

PhD in progress: Thomas SCHMITT, *A Collaborative Filtering Approach to Matching Job Openings and Job Seekers*, 1/11/2014, Philippe Caillou and Michèle Sebag and Jean-Pierre Nadal (EHESS)

PhD in progress : Lisheng SUN, *Apprentissage Automatique: Vers une analyse de données automatisé*, 1/10/2016, Isabelle Guyon and Michèle Sebag

PhD in progress : Corentin TALLEC, *Reinforcement Learning and Recurrent Neural Networks: dynamical approaches*, 1/10/2016, Yann Ollivier

PhD in progress : Pierre WOLINSKI, *Learning the Architecture of Neural Networks*, 1/9/2016, Guillaume Charpiat and Yann Ollivier

10.2.3. Juries

Marc Schoenauer, PhD jury of Jonathan GUERRA (ISAE, Toulouse), External reviewer of HDR of David Gianazza (IRIT, Toulouse).

Cyril Furtlehner, PhD jury of Christophe Schülke (Université Paris Diderot).

Isabelle Guyon, PhD jury of Mathieu Bouyrie (AgroPariTech), November 29, 2016. Restauration d'images de noyaux cellulaires en microscopie 3D par l'introduction de connaissance a priori.

Guillaume Charpiat, PhD jury of Thomas Bonis (Inria Saclay); jury for the SIF best PhD prize (Gilles Kahn).

Nikolaus Hansen, PhD jury of Oswin Krause (University of Copenhagen), January 8, 2016. External reviewer.

Michele Sebag, HdR jury of Matthieu Geist (U. Lille); PhD Jury Jiaxin Kou (Royal Holloway, London); PhD Phong N'guyen (U. Geneve).

10.3. Popularization

- **Yann Ollivier** coordinated, with IHP, numerous activities for the centenary of Claude Shannon, including a public exhibition at the Musée des Arts et Métiers, a cycle of public conferences, a contest for teachers on the best IT class project, and a workshop on the current state of information theory.
- **Yann Ollivier**, co-organizes the European Union Contest for Young Scientists (science fair for high school students from 30+ countries organized by the European Commission).
- **Aurélien Decelle**, participation to "la fête de la science" animating a presentation of arduino to high school students and families at Inria Turing.
- **Paola Tubaro**, invited talk on "Online social networks and eating disorders", ACT eating disorders association, Nîmes, 5 Feb.; invited talk on "Are we all digital laborers?", Autonomy salon of urban mobility, Paris, 8 Oct.; public interview, "L'économie peut-elle être collaborative? Rencontre avec la sociologue et chercheuse Paola Tubaro", Montréal, 2 Nov.; panelist at the round table "Big data, que fait-on de nos données?", organized at Museum of civilization, Québec, 3 Nov.; co-animator, workshop on big data in the "International science and society forum" for high school students, Québec, 4-6 Nov.; panelist at the round table "L'économie peut-elle être vraiment collaborative ET sociale et solidaire?", Ministry of the Economy, Paris, 13 Dec.
- **Paola Tubaro**, training on the digital society and its effects on labor and the economy, for union leaders (CGT, 27 Apr., CFDT, 23 Jun).
- **Paola Tubaro**, radio interviews and panels: Radio France Inter, Radio France Culture, ICI Radio Canada, Aligre.fm. Book reviews and mentions in the media: Le Monde, Rue89/L'Obs, Mashable/France24, Slate.fr, Journal International de Médecine, The Conversation.
- **io.datascience** notable presentations at: CNRS-Inria day *data4ist : exploration et analyse des sources de données pour la recherche et ses environnements* (May 2016) ; Futur en Seine 2016 (Juin 2016) ; DGESIP/MiPNES seminar *Normes et échanges de données : où en est-on ?* (September 2016).

ASPI Project-Team

9. Dissemination

9.1. Promoting scientific activities

9.1.1. Scientific events organisation

As part of statistics semester of Labex Lebesgue, Valérie Monbet has co-organized the 3rd workshop on **Stochastic Weather Generators**, held in Vannes in May 2016. This workshop aimed at bringing together a wide range of researchers, practitioners, and graduate students whose work is related to the stochastic modelling of meteorological variables and stochastic weather generators. Stochastic weather generators give us ability to reliably predict climate-related risks by simulating sequences of daily weather and climate consistent with specific aspects of climate variability and change. The simulated sequences of meteorological variables (rainfall, wind, temperature, etc.) are typically used as inputs into complex environmental and ecosystem models. They have a wide range of applications in hydrology, agriculture and environmental management.

Within the programme *École d'été France Excellence* promoted by the French embassy in China, she has co-organized a two-weeks **Summer School in Statistics**, held in Rennes in June/July 2016. This initiative has offered Chinese students the opportunity to attend graduate courses in statistics, including practical and seminar sessions.

9.1.2. Participation in workshops, seminars, lectures, etc.

In addition to presentations with a publication in the proceedings, which are listed at the end of the document, members of ASPI have also given the following presentations.

Frédéric Cérou has given an invited talk on the convergence of adaptive multilevel splitting at the **RESIM 2016** workshop held in Eindhoven in March/April 2016. He has given, jointly with Mathias Rousset, a talk on a central limit theorem for adaptive multilevel splitting at the 2nd meeting on **Adaptive Multilevel Splitting and Rare Events**, an event of the MSMATH ERC project held at CERMICS in Marne-la-Vallée, in June 2016.

Patrick Héas has given a talk on learning geophysical systems from images, at the seminar of ENS Rennes, in April 2016, and a talk on reduced modeling from partial observations, at the SIAM conference on **Uncertainty Quantification**, held in Lausanne, in April 2016.

François Le Gland has given a talk on marginalization for rare event simulation in switching diffusions at the **RESIM 2016** workshop held in Eindhoven in March/April 2016, and at the probability and statistics seminar of LJK (laboratoire Jean Kuntzmann) in Grenoble, in June 2016.

Valérie Monbet has given a talk on time varying autoregressive models for multisite weather generators at the 3rd workshop on **Stochastic Weather Generators**, held in Vannes in May 2016. She has also given a series of three lectures (including a lab session) at the *École d'été France Excellence* **Summer School in Statistics**, held in Rennes in June/July 2016.

9.1.3. Research administration

François Le Gland is a member of the *conseil d'UFR* of the department of mathematics of université de Rennes 1. He is also a member of the *conseil scientifique* for the EDF/Inria scientific partnership.

Valérie Monbet is a member of both the *comité de direction* and the *conseil* of IRMAR (institut de recherche mathématiques de Rennes, UMR 6625). She is also the deputy head of the department of mathematics of université de Rennes 1, where she is a member of both the *conseil scientifique* and the *conseil d'UFR*.

9.2. Teaching, supervision, thesis committees

9.2.1. Teaching

Patrick Héas gives a course on **Monte Carlo simulation methods in image analysis** at université de Rennes 1, within the SISEA (signal, image, systèmes embarqués, automatique, école doctorale MATISSE) track of the master in electrical engineering and telecommunications.

François Le Gland gives

- a 2nd year course on **introduction to stochastic differential equations**, at INSA (institut national des sciences appliquées) Rennes, within the GM/AROM (risk analysis, optimization and modeling) major in mathematical engineering,
- a 3rd year course on **Bayesian filtering and particle approximation**, at ENSTA (école nationale supérieure de techniques avancées), Palaiseau, within the statistics and control module,
- a 3rd year course on **linear and nonlinear filtering**, at ENSAI (école nationale de la statistique et de l'analyse de l'information), Ker Lann, within the statistical engineering track,
- a course on **Kalman filtering and hidden Markov models**, at université de Rennes 1, within the SISEA (signal, image, systèmes embarqués, automatique, école doctorale MATISSE) track of the master in electrical engineering and telecommunications,
- and a 3rd year course on **hidden Markov models**, at Télécom Bretagne, Brest.

Valérie Monbet gives several courses on data analysis, on time series, and on mathematical statistics, all at université de Rennes 1 within the master on statistics and econometrics. She is also the director of the master on statistics and econometry at université de Rennes 1.

9.2.2. Supervision

François Le Gland has been supervising one PhD student

- Alexandre Lepoutre, title: *Tracking and detection in Track–Before–Detect context using particle filtering*, université de Rennes 1, started in October 2010, defense held on October 5, 2016, funding: ONERA grant, co–direction: Olivier Rabaste (ONERA, Palaiseau).

Frédéric Cérou and François Le Gland are jointly supervising one PhD student

- Ramatoulaye Dabo, provisional title: *Rare event simulation in epidemiology*, université Assane Seck de Ziguinchor (Senegal) and université de Rennes 1, started in September 2015, expected defense in 2018, co–direction: Alassane Diedhiou (université Assane Seck de Ziguinchor).

François Le Gland and Valérie Monbet are jointly supervising one PhD student

- Thi Tuyet Trang Chau, provisional title: *Non parametric filtering for Metocean multi–source data fusion*, université de Rennes 1, started in October 2015, expected defense in October 2018, funding: Labex Lebesgue grant and Brittany council grant, co–direction: Pierre Ailliot (université de Bretagne Occidentale, Brest).

François Le Gland is supervising two other PhD students

- Kersane Zoubert–Ousseni, provisional title: *Particle filters for hybrid indoor navigation with smart-phones*, université de Rennes 1, started in December 2014, expected defense in 2017, funding: CEA grant, co–direction: Christophe Villien (CEA LETI, Grenoble),
- Audrey Cuillery, provisional title: *Bayesian tracking from raw data*, université du Sud Toulon Var, started in April 2016, expected defense in 2019, funding: CIFRE grant with DCNS, co–direction: Claude Jauffret (université du Sud Toulon Var) and Dann Laneuville (DCNS, Nantes).

Valérie Monbet is supervising two other PhD students

- Audrey Poterie, provisional title: *Régression d'une variable ordinale par des données longitudinales de grande dimension : application à la modélisation des effets secondaires suite à un traitement par radiothérapie*, université de Rennes 1, started in October 2015, expected defense in 2018, funding: INSA grant, co-direction: Jean-François Dupuy (INSA Rennes) and Laurent Rouvière (université de Haute Bretagne, Rennes).
- Marie Morvan, provisional title: *Modèles de régression pour données fonctionnelles. Application à la modélisation de données de spectrométrie dans le proche infra rouge*, université de Rennes 1, started in October 2016, expected defense in 2019, funding: MESR grant, co-direction: Joyce Giacomini (université de Haute Bretagne, Rennes) and Olivier Sire (université de Bretagne Sud, Vannes).

Mathias Rousset is supervising one PhD student

- Yushun Xu, provisional title: *Variance reduction of overdamped Langevin dynamics simulation*, université Paris-Est, started in October 2015, expected defense in 2018, co-direction: Pierre-André Zitt (université Paris-Est).

9.2.3. Thesis committees

François Le Gland has been a reviewer for the PhD theses of Tepmony Sim (Télécom ParisTech, advisors: Randal Douc and François Roueff) and Clément Walter (université Denis Diderot, Paris, advisor: Josselin Garnier).

Valérie Monbet has been a member of the committee for the HDR of Mathieu Emily (université de Haute Bretagne, Rennes).

Mathias Rousset has been a member of the committee for the PhD thesis of Zofia Trstanova (Inria Grenoble, EPI NANO-D, advisor: Stéphane Redon).

CQFD Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Selection

10.1.1.1. Member of the Conference Program Committees

J. Anselmi has been a member of the TPC of the international conferences: VALUETOOLS-2016, ASMTA-2016 and ECQT-2016.

F. Dufour is a member of the organizing committee of the international SIAM conference on Control & its Application, SIAM CT17.

M. Chavent has been vice-president of the program committee of the 5èmes Rencontres R in Toulouse in 2016.

10.1.2. Journal

10.1.2.1. Member of the Editorial Boards

F. Dufour is associate editor of the journal: SIAM Journal of Control and Optimization since 2009.

J. Saracco is an associate editor of the journal Case Studies in Business, Industry and Government Statistics (CSBIGS) since 2006.

10.1.2.2. Reviewer - Reviewing Activities

All the members of CQFD are regular reviewers for several international journals and conferences in applied probability, statistics and operations research.

10.1.3. Invited Talks

F. Dufour gave the following invited talks:

- *Unconstrained and Constrained Optimal Control of Piecewise Deterministic Markov Processes*, Workshop on switching dynamics & verification, Institut Henri Poincaré, Paris, France, January 28-29, 2016.
- *Stability of piecewise deterministic Markov processes*, Department of Statistics, Oxford University, United Kingdom, October 11, 2016.
- *Numerical Approximations for Average Cost Markov Decision Processes*, Inria Team TAO Seminar, February 9, 2016.

P. del Moral gave the following invited lectures:

- *An introduction to Feynman-Kac integration and genealogical tree based particle models*, Thematic Cycle on Monte-Carlo techniques, Labex Louis Bachelier, Institut Henri Poincaré, January 15, 22, 29, and February 12, 2016.
- *Mean Field Particle Samplers In Statistical Learning and Rare Event Analysis*, CFM-Imperial Distinguished Lecture Series, Imperial College, United Kingdom, October 18, 25, and November 1, 8, 2016.

A. Genadot gave the following talks:

- *Moyennisation à la mode de T. G. Kurtz pour des processus déterministes par morceaux*, Université de Lorraine, Nancy, January 14, 2016.
- *Averaging for some simple constrained Markov process*, Journées MAS, université Grenoble-Alpes, August 29, 30 and 31, 2016.

J. Saracco gave the following talks:

- *Analyse de la variance : une vision de type modèle linéaire gaussien ou comment expliquer une variable quantitative par un ou plusieurs facteurs qualitatifs*, University of Monastir (Tunisia), April 2016
- *Un exemple de régression semiparamétrique : l'approche SIR (sliced inverse regression)*, University of Monastir (Tunisia), April 2016
- *La régression par quantile non-paramétrique et semi-paramétrique*, "Les jeudis de Santé Publique", Paris, November 2016

J. Saracco was an invited professor at University of Monastir (Tunisia) in november 2016 and gave a course on Multidimensional Statistics.

Marie Chavent gave the following invited lecture :

- *Multivariate analysis of mixed data: The PCAmixdata R package*, CMStatistics, Seville, December 2016.

10.1.4. Research Administration

F. Dufour is member of the *Bureau du comité des projets*, Inria Bordeaux Sud-Ouest.

J. Saracco is deputy director of IMB (Institut de Mathématiques de Bordeaux, UMR CNRS 5251) since 2015.

M. Chavent is member of the national evaluation committee of Inria.

M. Chavent is member of the council of the Institut de Mathématique de Bordeaux.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- Licence : J. Anselmi, Probabilités et statistiques, 13 heures, Institut Polytechnique de Bordeaux, école ENSEIRB-MATMECA, filiere telecom, France.
- Licence : J. Anselmi, Probabilités et statistiques, 13 heures, Institut Polytechnique de Bordeaux, école ENSEIRB-MATMECA, filiere electronique, France.
- Licence: M. Chavent, Analyse des données, 15 ETD, L3, Bordeaux university, France
- License: M. Chavent, Modélisation statistique, 15 ETD, niveau L3, Bordeaux university, France
- Master : M. Chavent, Apprentissage automatique, 50 ETD, niveau M2, Bordeaux university, France
- Licence : F. Dufour, Probabilités et statistiques, 16 heures, niveau L3, Institut Polytechnique de Bordeaux, école ENSEIRB-MATMECA, France.
- Master : F. Dufour, Méthodes numériques pour la fiabilité, 24 heures, niveau M1, Institut Polytechnique de Bordeaux, école ENSEIRB-MATMECA, France.
- Master : F. Dufour, Probabilités, 20 heures, niveau M1, Institut Polytechnique de Bordeaux, école ENSEIRB-MATMECA, France.
- P. Legrand, Algèbre (responsable de l'UE), Licence 1 SCIMS (108 heures)
- P. Legrand, Informatique pour les mathématiques (responsable de l'UE), Licence 1 et Licence 2 (36 heures)
- P. Legrand, Espaces Euclidiens. (responsable de l'UE), Licence 2 SCIMS (54 heures)
- P. Legrand, Formation Matlab pour le personnel CNRS (responsable de l'UE), (24 heures)
- Licence: J. Saracco, Probability and Descriptive statistics, 27h, L3, First year of ENSC - Bordeaux INP, France
- Licence: J. Saracco, Mathematical statistics, 20h, L3, First year of ENSC - Bordeaux INP, France

- Licence: J. Saracco, Data analysis (multidimensional statistics), 20h, L3, First year of ENSC - Bordeaux INP, France
- Master: J. Saracco, Statistical modeling, 27h, M1, Second year of ENSC - Bordeaux INP, France
- Master: J. Saracco, Applied probability and Statistics, 40h, M1, Second year of ENSCBP - Bordeaux INP, France
- Master: J. Saracco, Probability and Statistics, 12h, M2, Science Po Bordeaux, France
- A. Genadot, Probabilités de bases (18h), Licence MIASHS première année, Université de Bordeaux.
- A. Genadot, Statistiques de bases (18h), Licence MIASHS première année, Université de Bordeaux.
- A. Genadot, Probabilités (36h), Licence MIASHS deuxième année, Université de Bordeaux.
- A. Genadot, Processus (18h), Licence MIASHS troisième année, Université de Bordeaux.
- A. Genadot, Modélisation statistique (18h), Licence MIASHS troisième année, Université de Bordeaux.
- A. Genadot, Martingales (25h), Master MIMSE première année, Université de Bordeaux.
- A. Genadot, Probabilités (20h), Master MEEF première année, Université de Bordeaux.

10.2.2. Supervision

- PhD completed: Adrien Todeschini, Elaboration et validation d'un système de recommandation bayésien, supervised by F. Caron and M. Chavent.
- PhD completed: Christophe Nivot, Optimisation de la chaîne de montage du futur lanceur européen, May 2016, B. supervised by B. de Saporta and F. Dufour.
- PhD in progress : Alizé Geeraert, Contrôle optimal des processus Markoviens déterministes par morceaux et application à la maintenance, University of Bordeaux, supervised by B. de Saporta and F. Dufour (defense scheduled in June 2017).
- PhD in progress : Ines Jlassi, Contributions à la régression inverse par tranches et à l'estimation non para métrique des quantiles conditionnels, University of Monastir (Tunisia), September 2013, supervised by J. Saracco and L. Ben Abdelghani Bouraoui.
- PhD in progress : Hadrien Lorenzo, Analyses de données longitudinales de grandes dimensions appliquées aux essais vaccinaux contre le VIH et Ebola, University of Bordeaux, September 2016, supervised by J. Saracco and R. Thiebaut.

10.2.3. Juries

J. Saracco is vice president of the french statistical society (SFdS).

MATHRISK Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

- B. Jourdain (with B. Bouchard and E. Gobet): organization of the 2015-2016 thematic semester on Monte Carlo methods financed by the Institute Louis Bachelier, and the closing conference.
- A. Alfonsi: Co-organizer of the working group seminar of MathRisk “Méthodes stochastiques et finance”. <http://cermics.enpc.fr/~alfonsi/GTMSF.html>
- A.Sulem : Co-organiser of the joint working group seminar MathRisk/LPMA, University Paris-Diderot : "Mathematical finance and numerical probability".

10.1.1.1. Member of the Organizing Committees

J. Lelong:

- journées MAS 2016, Grenoble.
- CEMRACS 2017
- Les Journées de Probabilités 2017
- session organizer at CANUM 2016
- Session organizer at “The International Conference on Monte Carlo techniques”, 2016, Paris

10.1.2. Scientific Events Selection

10.1.2.1. Reviewer

A. Sulem is Reviewer for *Mathematical Reviews*

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- R. Elie
Associate editor of *SIAM Journal on Financial Mathematics (SIFIN)* (since November 2014)
- D. Lamberton
Associate editor of
 - Mathematical Finance,
 - Associate editor of ESAIM Probability & Statistics
- A. Sulem
Associate editor of
 - 2011- Present: *Journal of Mathematical Analysis and Applications (JMAA)*
 - 2009- Present: *International Journal of Stochastic Analysis (IJSA)*
 - 2008- Present: *SIAM Journal on Financial Mathematics (SIFIN)*

10.1.3.2. Reviewer - Reviewing Activities

The members of the team reviewed numerous papers for numerous journals .

10.1.4. Invited Talks

- A. Alfonsi
 - January 15th 2016: "Wishart processes: MLE estimation and interest rate modelling", North British Probability seminar, Edinburgh.
 - February 5th 2016: "Dynamic optimal execution in a mixed-market-impact Hawkes price model", Frontiers in Stochastic Modeling for Finance, Padua, Italy
 - October 7th 2016: "Maximum Likelihood Estimation for Wishart processes" WORKSHOP USPC-NUS Models and numerical methods for financial risk management, Paris Diderot.
 - November 17th 2016: "Extension and calibration of a Hawkes-based optimal execution model", SIAM Conference on Financial Mathematics & Engineering, Austin.
 - December 9th 2016: "Optimal Execution in a Hawkes Price Model and Calibration", Market Microstructure Confronting many viewpoints #4, Paris.
- B. Jourdain
 - Seminar of the chair "financial risks", June 3rd 2016 : Strong convergence properties of the Ninomiya-Victoir scheme and applications to multilevel Monte Carlo
 - Seminar Mathrisk P7, September 22th 2016 : Existence for a calibrated regime-switching local volatility model
- C. Labart
 - Frontiers in stochastic modelling for finance, Padua and Venice, Italy, February 2016.
 - Closing International Conference of Thematic cycle on Monte-Carlo techniques, Paris, July 2016.
- J. Lelong
 - CANUM 2016
 - Seminar on Insurance Mathematics and Stochastic Finance at ETH Zurich, May 2016.
 - Journées MAS 2016.
 - Closing International Conference of Thematic cycle on Monte-Carlo techniques, Paris, July 2016
 - Frontiers in stochastic modelling for finance, Padua and Venice, Italy, February 2016
- A. Sulem
 - Stochastic analysis, control and games with applications to financial economics, University of Leeds, November 2016.
 - National University of Singapore/ Université Paris-Diderot workshop on quantitative finance, October 2016, Paris.
 - Abel Symposium 2016 "Computation and Combinatorics in Dynamics, Stochastics and Control", August 2016, Barony Rosendal, Norway. <http://hans.munthe-kaas.no/AbelSymp2016/>
 - Simulation of Stochastic graphs and applications, closing conference on " Monte-Carlo techniques", Paris, July 2016
 - Conference "Frontiers in Stochastic Modelling for Finance", Padua and Venice, Italy, February, 2016. https://www.maths.univ-evry.fr/conferences/padova2016/index_ws.htm
 - "Actuarial and Financial Mathematics Conference" (Plenary talk) , February 2016, Brussels, Belgium.
<http://www.afmathconf.ugent.be>
- A. Zanette

"Hybrid tree-finite difference methods for the Heston, Bates and Heston Hull-White models". SIMAI Politecnico di Milano 2016.

10.1.5. Research Administration

- A. Sulem : Member of the Committee for technology development, Inria Paris
- B. Jourdain : Head of the doctoral school MSTIC, university Paris-Est

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Undergraduate programs

- A. Alfonsi: ‘Probabilités’, first year course at the Ecole des Ponts.
- B. Jourdain :
 - course "Mathematical finance", 2nd year ENPC
 - course "Introduction to probability theory", 1st year, Ecole Polytechnique
- B. Jourdain, B. Lapeyre course "Monte-Carlo methods", 3rd year ENPC and Master Recherche Mathématiques et Application, Université Paris-Est Marne-la-Vallée

Graduate programs

- A. Alfonsi:
 - “Traitement des données de marché : aspects statistiques et calibration”, lecture for the Master at UPEMLV.
 - “Mesures de risque”, Master course of UPEMLV and Paris VI.
 - Professeur chargé de cours at Ecole Polytechnique
- J.-F. Delmas, B. Jourdain course "Jump processes with applications to energy markets", 3rd year ENPC and Master Recherche Mathématiques et Application, Université Paris-Est Marne-la-Vallée
- B. Jourdain
 - course "Stochastic numerical methods", 3rd year, Ecole Polytechnique
 - projects in finance and numerical methods, 3rd year, Ecole Polytechnique
- A. Sulem
 - "Finite difference for PDEs in Finance", Master 2 MASEF, Université Paris IX-Dauphine, Département Mathématiques et Informatique de la Décision et des Organisations (MIDO), 18h.
 - Master of Mathematics, University of Luxembourg, 22 h lectures and responsible of the module "Numerical Methods in Finance".

Doctoral programs

- A. Sulem: International summer school in mathematical finance, University of Alberta in Edmonton, Canada "Informational and Imperfect Financial Markets", <https://www.pims.math.ca/scientific-event/160625-pssmf> (5 lectures)

10.2.2. Supervision

- PhD :
 - Anis Al Gerbi : "Ninomiya-Victoir scheme: strong convergence, asymptotics for the normalized error and multilevel Monte Carlo methods", Université Paris-Est supervised by B. Jourdain and E. Clément, defended on October 10 2016
- PhD in progress :
 - Rui Chen (Fondation Sciences Mathématiques de Paris grant), "Stochastic Control of mean field systems and applications to systemic risk, from September 2014, Université Paris-Dauphine, Supervisor: A. Sulem

Marouen Iben Taarit , “ On CVA and XVA computations ”, CIFRE Natixis/ENPC, Adviser: Bernard Lapeyre

Giulia Terenzi , "American options in complex financial models", Université Paris-Est Marne-la-Vallée, Supervisors: Damien Lamberton and Lucia Caramellino, from University Tor Vergata, Rome

Alexandre Zhou (started November 2015) "Analysis of stochastic particle methods applied to finance", supervised by B.Jourdain

10.2.3. Juries

- B. Jourdain
 - PhD of Khaled Salhi, defended on December 5, University of Lorraine
 - Reviewer for the PhD of Anthony Le Cavil, defended on December 9, University Paris-Saclay
- A. Sulem

PhD Richàrd Fischer, *Modélisation de la dépendance pour des statistiques d'ordre et estimation non-paramétrique*, (Modelling the dependence of order statistics and nonparametric estimation), (Jury chair), defended on September 30 2016, Ecole des Ponts.

TOSCA Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Promotion of Mathematics in the industry

- M. Deaconu and A. Lejay were invited to give a talk at ILAC, Luxembourg in March 2016.
- A. Lejay has been appointed as representative of Inria Nancy-Grand Est in the Agence Mathématiques et Entreprise (AMIES).
- D. Talay continued to serve as the Vice-President of the Fondation d'Entreprise Natixis which aims to contribute to develop research in quantitative finance. He also serves as a member of the Scientific Committee of the Foundation.
- D. Talay continued to serve as a member of the Scientific Committee of the AMIES National Agency aimed to promote interactions between Mathematics and Industry.

9.1.2. Scientific Events Organisation

- N. Champagnat and M. Deaconu organized the mini-symposium “Un panorama de progrès récents sur les méthodes numériques probabilistes” at CANUM 2016 (Congrès d'Analyse Numérique) at Obernai in July 2016.

9.1.2.1. Member of the Organizing Committees

- A. Lejay was member of the conference organizing committees of *CANUM 2016* (Obernai, France).

9.1.3. Scientific Events Selection

9.1.3.1. Member of the Conference Program Committees

- N. Champagnat served as a member of the program committee of CARI 2016 (13ème Colloque Africain sur la Recherche en Informatique et Mathématiques Appliquées), Tunis, 10–14 octobre 2016.
- A. Lejay is member of the conference program committees of *CANUM 2016* (Obernai, France) and *Journées de Probabilités 2016* (Le Mans, France).
- D. Talay served as a member of the XIIIth France-Romania Colloquium in Applied Mathematics.
- E. Tanré served as a member of the program committee of the International Conference on Mathematical NeuroScience (ICMNS 2016), Juan les Pins.

9.1.4. Journal

9.1.4.1. Member of the Editorial Boards

- M. Bossy served as an Associate Editor of *Annals of Applied Probability*.
- N. Champagnat served as an Associate Editor of *Stochastic Models*.
- A. Lejay is one of the three editors of the *Séminaire de Probabilités*.
- D. Talay served as an Associate Editor of: *Stochastic Processes and their Applications*, *ESAIM Probability and Statistics*, *Stochastics and Dynamics*, *Journal of Scientific Computing*, *Monte Carlo Methods and Applications*, *Oxford IMA Journal of Numerical Analysis*, *SIAM Journal on Scientific Computing*, *Communications in Applied Mathematics and Computational Science*, *Éditions de l'École Polytechnique*. He also served as the Co-editor in chief of *MathematicS in Action*.

9.1.4.2. Reviewer - Reviewing Activities

- M. Deaconu wrote reviews for manuscripts submitted to *Journal of Computational and Applied Mathematics*.
- A. Lejay wrote reviews for manuscripts submitted to *Journal of Computational Mathematics, Mathematics and Computers in Simulation, Mathematical Reports, SIAM Journal of Control and Optimization, Communications in Mathematical Physics, Real Analysis Exchange, Annals of Probability, Electronic Journal of Probability*.
- E. Tanré wrote reviews for manuscripts submitted to *Applied Mathematical Finance, Bernoulli, European Journal of Applied Mathematics*.
- E. Tanré serves as a permanent reviewer of *Mathematical Reviews of the American Mathematical Society (MathSciNet)*
- D. Villemonais wrote reviews for *Mathematical Reviews of the American Mathematical Society (MathSciNet)* and for manuscripts submitted to *Stochastic processes and applications* and *Theoretical Population Biology*.

9.1.5. Invited Talks

- M. Bossy has been invited to give a talk at the seminar of the Laboratoire Jacques-Louis Lions, in May.
- M. Bossy has been invited to give a seminar talk at the Rencontre Niçoise de Mécanique des Fluides, at the Observatoire de la Côte d'Azur in Nice, June
- M. Bossy has been invited to give a talk at the symposium *SDE approximation* at the International Conference on Monte Carlo techniques, In Paris, July.
- N. Champagnat has been invited to give talks at the conference *Stochastic PDE's, Large Scale Interacting Systems and Applications to Biology* in Orsay in March, to the CMO-BIRS workshop *Stochastic and Deterministic Models for Evolutionary Biology* in Oaxaca, Mexico, in August and at the conference *Probabilistic structures in deterministic population genetics* in Vienna in November.
- N. Champagnat has been invited to give seminar talks at *TOSCA seminar* in Inria Sophia Antipolis in April, at the *MAPMO probability seminar* in October and at the seminar *Méthodes probabilistes et statistiques en dynamique des populations* in Grenoble in December.
- N. Champagnat has been invited to give a lecture at the CIMPA School *Mathématiques pour la Biologie* (4h) in Tunis in October.
- M. Deaconu was invited to give a talk at the *Colloque Franco Roumain de Mathématiques Appliquées*, Iași (Romania) in August 2016.
- C. Fritsch has been invited to give talks at the *Workshop on "Approche Interdisciplinaire en Evolution"* in Saint-Martin-de-Londres in December.
- A. Lejay has been invited to give talk at the *Workshop on Numerical Schemes of SDE and SPDE* in Lille in June 2016, and at the *International Conference on Monte Carlo techniques* in Paris in July 2016.
- A. Lejay has been invited to give a seminar talk at the Université de Reims in February 2016.
- P. Pigato gave talks at the Probability Seminar of Luxembourg University, in January, at the Seminar of TOSCA-Sophia Antipolis, in February, at the Seminar of CIMFAV (Valparaíso) in March, at the Journées de Probabilités 2016, in May, at the Probability Seminar of Università degli studi di Padova, in June, and at the London-Paris Bachelier Workshop on Mathematical Finance in September.
- A. Richard gave seminar talks at the LPMA (Paris 6) Probability seminar and the IMT (Toulouse) probability seminar in February, at the Groupe de Travail on stochastic models in finance at Ecole Polytechnique and at the Barcelona probability seminar in April.
- A. Richard had an accepted talk at ICMNS 2016.

- D. Talay gave a lecture at the Mean-field and population-level descriptions of brain dynamics Meeting in February at the EITN, Paris, the opening lecture at the conference in V. Kononov's honor in Moscow in June, a mini-course at Lille University in June, and an invited lecture at the Workshop on the Numerics for Stochastic Partial Differential Equations and their Applications at RICAM, Linz (Austria) in December.
- E. Tanré gave talks at LPMA (Paris 6) and at the workshop on Numerical schemes for SDEs and SPDEs in Lille in June.
- D. Villemonais has been invited to give talks at the workshop *Stochastic processes under constraints* in July in Augsburg, Germany, at the conference *Colloque franco-roumain de mathématiques* in August in Iași, Romania, and at the *School on Information and Randomness* in December in Santiago, Chile.
- D. Villemonais has been invited to give seminar talks at *Institut Montpellierain Alexander Grothendieck* in February, at the *Institut de Recherche Mathématique Avancée* in Strasbourg in November, and at the *Modal'X seminar* in Nanterre in December.

9.1.6. Leadership within the Scientific Community

- A. Lejay is the head of the Probability and Statistics team of the Institut Élie Cartan since September 2016.
- A. Lejay was a member of the Administration Council of the SMAI until June 2016.
- D. Talay continued to chair the Scientific Council of the French Applied Math. Society SMAI.
- D. Talay served as a member of the scientific council of the Complex System academy of the UCA Idex.
- D. Talay is serving as a member of the committee in charge of preparing the application of Paris to the International Congress of Mathematicians 2022.

9.1.7. Scientific Expertise

- N. Champagnat reported on an application submitted to CONICYT (Chilean Funding Agency).
- M. Deaconu has been a member of the Committee for junior permanent research positions of Inria Nancy - Grand Est.
- A. Lejay reported on applications to National Science Centre of Poland.
- A. Lejay participated in a Professor position recruitment committee at Université de Lorraine.

9.1.8. Research Administration

- M. Bossy is an elected member of the Inria Evaluation Board.
- M. Bossy has been a member of the DTK-Committee.
- N. Champagnat is a member of the *Commission de Développement Technologique* and the *Commission Information Scientifique et Technique* of Inria Nancy - Grand Est, a substitute member of the *Comité de Centre* of Inria Nancy - Grand Est (until Nov. 2016), *Responsable Scientifique* for the library of Mathematics of the IECL, member of the *Conseil du laboratoire* of IECL (as *responsable scientifique* of the library). He is also local correspondent of the COERLE (*Comité Opérationnel d'Évaluation des Risques Légaux et Éthiques*) for the Inria Research Center of Nancy - Grand Est. This year, together with Aline Wagner (Inria Nancy - Grand Est), he finished to write the new version of the application form for research approval by the COERLE.
- M. Deaconu is a member of the *Bureau du Comité de Projets* of Inria Nancy - Grand Est, and of the *Comité de Projet* of Inria Nancy - Grand Est.
- A. Lejay is a member of the COMIPERS of Inria Nancy Grand-Est and of *Commission des thèses* of the Institut Élie Cartan (Nancy).

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Master: M. Bossy, *Continuous time stochastic models for quantitative Finance*, 30h, M2 IMAFA (Informatique et Mathématiques Appliquées à la Finance et à l'Assurance), École Polytechnique Universitaire, Univ. Nice - Sophia Antipolis, France.

Master : M. Bossy, *Risk on energetic financial markets*, 27h, Master Spécialisé, Ingénierie et Gestion de l'Énergie, Mine ParisTech, France.

Master : M. Bossy *Stochastic Particle Methods for PDEs*, 18h, M2 Probabilité et Applications, Université Pierre et Marie Curie, France.

PhD-level lectures : M. Bossy *McKean SDEs and related stochastic methods for PDEs*, 18h, University of Edinburgh (UK).

PhD-level lectures : M. Bossy *Stochastic numerical methods for turbulence*, Winter school Numerics for Stochastic Partial Differential Equations and their Applications, 10h, at RICAM - University of Linz.

Master: N. Champagnat, *Introduction to Quantitative Finance*, 18h, M1, École des Mines de Nancy, France.

Master: N. Champagnat, *Introduction to Quantitative Finance*, 13.5h, M2, École des Mines de Nancy, France.

Master: N. Champagnat, *Chaînes de Markov*, 22.5h, M2 "double diplôme" Mathématiques et Applications - École Supérieure des Sciences et de Technologie de Hammam Sousse, Tunisie (lieu des cours) - Université de Lorraine, France.

Master: M. Deaconu, *Équations différentielles stochastiques : résolution numérique et applications*, 21h, M2, École des Mines de Nancy, France.

Master: M. Deaconu, *Modélisation stochastique*, 30h, M2, Université de Lorraine, France.

Master: M. Deaconu, *Simulation Monte Carlo*, 24h, M1, Faculté de Droit, Sciences Economiques et Gestion, Université de Lorraine, France.

Master: C. Fritsch, *Introduction à la finance quantitative*, 3h, M1, École des Mines de Nancy, France.

Licence: C. Fritsch, *Décision et Prévision Statistiques*, 20h, L3, École des Mines de Nancy, France.

Licence: C. Fritsch, *Supervision d'un projet de recherche*, 6h, M2, École des Mines de Nancy, France.

Licence: B. Henry, *Statistiques*, 20h, L3, École des Mines de Nancy, France.

Licence: B. Henry, *Probabilités*, 36h, L3, École des Mines de Nancy, France.

Master: A. Lejay, *Simulation des marchés financiers*, 28.5h, M2, Université de Lorraine (Metz), France.

Master: P. Pigato, *Calcul Intégral*, 15h, M1, Université de Lorraine (Nancy), France.

Licence: K. Salhi, *Mathématiques Appliquées et Probabilités*, 24h, L3, Télécom Nancy, France.

Master: K. Salhi, *Statistiques et analyse de données*, 20h, M1, Télécom Nancy, France.

Master: K. Salhi, *Probabilités et Statistiques*, 20h, M1, ENSEM Nancy, France.

Master: D. Talay *Invariant measures of diffusion processes*, 18h, M2 Probabilité et Applications, Université Paris 6, France.

Master: E. Tanré (cours) and M. Tomasevic (exercices), *Advanced Numerics for Computational Finance*, 30h (20h + 10h), M2, UCA (Mathmods Erasmus Mundus), France.

Master: E. Tanré, *Mathematical Methods for Neurosciences*, 37h, M2, ENS - Master MVA / Paris 6 - Master Maths-Bio, France.

Master: E.Tanré (courses) and A. Richard (practical classes) *Numerical probability for mathematical finance*, 20h (8h + 12h), M2, EPU (Master IMAFA), France.

9.2.2. Supervision

PhD: Maxime Bonelli, *Behavioral finance approach to risk assessment in quantitative portfolio management*, Univ. Nice Sophia Antipolis, September 2016, M. Bossy.

PhD : Benoît Henry, *Processus de branchements non markoviens en dynamique et génétique des populations*, Univ. Lorraine, 17/11/2016, Nicolas Champagnat, D. Ritchie (EPI CAPSID).

PhD : Khaled Salhi, *Risques extrêmes en finance : analyse et modélisation*, Univ. Lorraine, 05/12/2016, M. Deaconu and A. Lejay.

PhD in progress: Antoine Brault, *Formules de Trotter-Kato pour les trajectoires rugueuses*, Université Toulouse 3, L. Coutin (U. Toulouse 3), A. Lejay.

PhD in progress: Baldwin Dumortier, *Contrôle acoustique des éoliennes*, October 2014, M. Deaconu and E. Vincent (EPI MULTISPEECH).

PhD in progress: Pascal Helson, *Plasticity in networks of spiking neurons in interaction*, October 2016, E. Tanré and R. Veltz (MATHNEURO Inria team).

PhD in progress: Kouadio Jean Claude Kouaho, *Modélisations stochastique et déterministe de croissance de tumeurs cancéreuses*, Mar. 2016, N. Champagnat, Pierre Vallois (EPI BIGS, Modest N’Zi (UFHB, Abidjan).

PhD in progress: Radu Maftai, *A stochastic approach to colloidal particle agglomeration in turbulent flows*, November 2014, M. Bossy.

PhD in progress: Hernán Mardones, *Numerical solutions of stochastic differential equations with multiplicative noise*, Universidad de Concepción, A. Lejay, C. Mora (U. Concepción).

PhD in progress: Milica Tomasevic, *Stochastic approaches to Keller–Segel equations*, October 2015, D. Talay.

9.2.3. Juries

- M. Bossy served as a referee for the Ph.D. theses of Anthony LE CAVIL, *Représentation probabiliste de type progressif d’EDP nonlinéaires nonconservatives et algorithmes particuliers associés*, Université Paris Saclay, December 9, 2016.
- M. Bossy served as an examiner for the Ph.D. thesis of Ahmed MTIRAOUI , *EDS Progressives Rétrogrades couplées contrôlées, EDDS Rétrogrades et EDP Stochastiques*. Université de Toulon, November the 25th, 2016.
- N. Champagnat served as a referee for the Ph.D. theses of Elma Nessar, *Modèles probabilistes de l’évolution d’une population dans un environnement variable*, Univ. Aix-Marseille, July 4, 2016, and of Joseba Dalmau, *La quasi-espèce pour une population finie*, Univ. Orsay, November 25, 2016.
- N. Champagnat served as an examiner for the Ph.D. thesis of Lucas Mercier, *Grands graphes et grand arbres aléatoires : Analyse du comportement asymptotique*, Univ. Lorraine, May 11, 2016, and of Benoît Henry, *Processus de branchements non markoviens en dynamique et génétique des populations*, Univ. Lorraine, November 17, 2016.
- A. Lejay served as a referee for the Ph.D. theses of Sarav Mazzone, *On the exact simulation of (Skew) Brownian Diffusions with Discontinuous Drift*, Potsdam Universität / Université Lille 1, November 2016, of Anis Al Gerbi, *Ninomiya-Victoir scheme: strong convergence, asymptotics for the normalized error and multilevel Monte Carlo methods*, Université Paris-Est, October 2016, and of Joseph El Maalouf, *Méthodes de Monte Carlo stratifiées pour la simulation des chaînes de Markov*, Université de Grenoble / Université Saint Joseph de Beyrouth, December 2016.
- A. Lejay served as an examiner for the Habilitation Thesis of Pierre Étoré, *Quelques contributions à l’étude et à la simulation des diffusions asymétriques*, Université de Grenoble, December 2016.

- M. Deaconu and A. Lejay served as examiners for the Ph.D. thesis of Khaled Salhi, *Risques extrêmes en finance : analyse et modélisation*, Université de Lorraine, December 2016.
- D. Talay chaired the Ph.D. thesis jury of Ahmed Mtiraoui, *Equations différentielles stochastique rétrogrades progressives et leurs applications aux théories de contrôles*, Université de Toulon.
- D. Talay served as a referee for the Ph.D. theses of Daoud Ounaissi, *Méthodes Quasi Monte-Carlo et Monte-Carlo applications aux calculs des estimateurs Lasso et Lasso bayésien*, université de Lille I; and of Ahmed Bel Hadj Ayed *Robustesse de la stratégie de trading optimale*, École Centrale Paris;
- D. Talay chaired the Habilitation à Diriger les Recherches juries of Christophette Blanchet-Scalliet, *Contribution à l'analyse des risques financiers : risque de crédit, asymétrie d'information, analyse chartiste*, École Centrale de Lyon, and of Pierre Étoré, *Quelques contributions à l'étude et à la simulation des diffusions asymétriques*, INP Grenoble.

9.3. Popularization

- D. Talay participated in a scientific France Culture radio program in December.