RESEARCH CENTER

FIELD
Applied Mathematics, Computation and Simulation

Activity Report 2018

Section Dissemination

Edition: 2019-03-07

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 is member of the the scientific committee of the annual seminar CEA-GAMNI *"Numerical fluid-mechanics"*.
- P. Goatin was member of the scientific committee of *"HYP2018 - Conference on Hyperbolic Problems: Theory, Numerics, and Applications"*, Penn State (USA), June 2018.
- P. Goatin was member of the scientific committee of *"PED2018 - Conference on Pedestrian and Evacuation Dynamics"*, Lund (Sweden), August 2018.

9.1.1.2. Member of the Organizing Committees

- P. Goatin and M.L. Delle Monache (Inria Grenoble) organized the mini-symposium *"Modélisation et gestion du trafic routier"*, CANUM 2018 - 44e Congrès National d'Analyse Numérique, Cap d'Agde (France), May 2018.
- P. Goatin and J. Pettré (Inria Rennes) organized the workshop *"Modélisation du piéton et de la foule en mouvement"*, Saclay (France), November 2018.
- P. Goatin was member of the organizing committee of the workshop *"Mathematical modeling with measures: where applications, probability and determinism meet"*, Lorentz Center, Leiden (The Netherlands), December 2018.
- R. Duvigneau and A. Habbal are members of the OC for the FGS French-German-Swiss Conference on Optimization, Nice, September 2019.

9.1.2. Scientific Events Selection

9.1.2.1. Member of the Conference Program Committees

- A. Habbal was PC member of the African Conference on Research in Computer Science and Applied Mathematics (CARI 2018), Stellenbosch, South Africa
- P. Goatin was member of the International Program Committee of *"CTS2018 - 15th IFAC Symposium on Control in Transportation Systems"*, Savona (Italy), June 2018.

9.1.3. Journal

9.1.3.1. Member of the Editorial Boards

- P. Goatin is Managing Editor of *Networks and Heterogeneous Media*.

9.1.3.2. Reviewer - Reviewing Activities

- J.-A. Désidéri has made reviews for *Mathematical Problems in Engineering* (Hindawi Publishing Corporation) and *Numerical Algorithms* (Springer),
- R. Duvigneau 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 reviewed for the following international journals: SIAM Journal of Applied Mathematics; Networks and Heterogeneous Media; European Journal of Applied Mathematics; Journal of Advanced Transportation; IEEE Transactions on Intelligent Transportation Systems; Discrete and Continuous Dynamical Systems A.

- A. Habbal is reviewer for the following international journals: Journal of Structural and Multidisciplinary Optimization ; Journal of Math. Model. Nat. Phenom. ; Int. Journal of Mathematical Modeling and Numerical Optimization; Journal of Differential Equations; American Mathematical Society Reviews; European Journal of Operation Research (EJOR); Journal of Optimization Theory and Algorithms (JOTA).

9.1.4. Invited Talks

- F.A. Chiarello: Interactive workshop on hyperbolic equations, University of Ferrara (Italy), September 2018.
  Invited talk: *"Non-local multi-class traffic flow models"*.
- J.-A. Désidéri: Prioritized Multiobjective Optimization Using Nash Games - Towards Adaptive Optimization, ONERA, Toulouse, December 20, 2018.
- P. Goatin: ECMI 2018 - 20th European Conference on Mathematics for Industry, Budapest (Hungary), June 2018.
  Plenary talk: *"Traffic management by macroscopic models"*.
- P. Goatin: 14th Franco-Romanian Conference on Applied Mathematics, Bordeaux (France), August 2018.
  Plenary talk: *"Traffic management by macroscopic models"*.
- P. Goatin: Rencontres Normandes sur les aspects théoriques et numériques des EDP, Rouen (France), November 2018.
  Invited talk: *"Conservation laws with local constraints arising in traffic modeling"*.
- P. Goatin: LIA COPDESC Workshop "Analysis, control and inverse problems for PDEs", Napoli (Italy), November 2018.
  Plenary talk: *"Traffic control by autonomous vehicles"*.
- P. Goatin: CDC 2018 - 57th IEEE Conference on Decision and Control, Miami, FL (USA), December 2018. Workshop "Traffic Flow Control via PDE Techniques".
  Invited talk: *"Macroscopic modeling of traffic control by autonomous vehicles"*.
- A. Habbal: XI NPU-UTC Sino-French Seminar on Mechanics and Design of Advanced Material and Structures Symposium, Xi'An, China, April 2018.
  Plenary talk: *Games to solve Joint Data Completion and Obstacle Detection in Stokes Problems*.
- A. Habbal: Univ. Wurzburg Chair of Mathematics (Scientific Computing) Mathematical Colloquium, Wurzburg, May 2018.
  Plenary talk: *Games to solve Joint Data Completion and Obstacle Detection in Stokes Problems*.
- A. Habbal: Conference on Inverse Problems, Control and Shape Optimization (PICOF) Beirut, Lebanon, June 18-20 2018.
  Invited talk: *Detection of inclusions while recovering boundary data in Stokes Flows using Nash strategies*.
- A. Habbal: University Mohamed V, Rabat, June 2018.
  Plenary talk: *Avoidance mechanisms arising as Nash equilibria in Fokker-Planck constrained games*.
- E. Rossi: IFIP TC 7 Conference on System Modelling and Optimization, Essen (Germany), July 2018. Workshop "Modeling and optimization of networked systems".
  Invited talk: *"Crowd dynamics in domains with boundaries"*.

9.1.5. Scientific Expertise

- P. Goatin was proposals reviewer for FONDECYT program of CONICYT (National Committee of Science and Technology Research, Chile), 2018.

9.1.6. Research Administration

- P. Goatin is member of the board of the Doctoral School of Fundamental and Applied Sciences (ED SFA) of Université Côte D'Azur.
- P. Goatin was member of BCP ("Bureau du Comité des Projets") at Inria Sophia Antipolis Méditerranée (until August 2018).
- P. Goatin was member of the admission committee for Inria 2018 competitive selection of senior researchers (DR2).
- R. Duvigneau is member of CSD ("Comité Suivi Doctoral) at Inria Sophia Antipolis Méditerranée.
- R. Duvigneau is responsible for the Immersive Space Committee 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).

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: Optimization, 66 hrs, M1, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal).

Master: Modeling strategies for e-Formula races, 10 hrs, M1 Students Project, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal).

Master: Multi-agents Systems, 10 hrs, M1 Students Project, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal).

Master: Modeling and simulation of electric mobility, 10 hrs, M1 Students Project, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal).

Licence (L3): Implement and Experiment PSO, 48hrs, L3 Semester Project, Ecole Polytechnique Universitaire (EPU), Nice Sophia Antipolis (A. Habbal).

Graduate autumn school "Theoretical and numerical aspects of PDEs", Rouen (France), November 2018. Lecture: *"Macroscopic traffic flow models on networks"* (P. Goatin).

9.2.2. Supervision

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

PhD in progress: Marwa Ouni, *Solving inverses problems in fluid mechanics with game strategies*, October 2016, 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 defended in June 2018: C. Durantin, *Métamodélisation et optimisation de dispositifs photoniques* (Meta-modelling and Optimization for nanophotonic devices), University of Nice - Sophia Antipolis, June 2018. Supervisors: J.-A. Désidéri and A. Glière (CEA LETI).

PhD defended in October 2018: Q. Mercier, *Algorithme de descente pour la résolution de problèmes d'optimisation multiobjectif sous incertitudes* (Descent Algorithm for the solution of multi-objective optimization problems under uncertainties), University of Nice - Sophia Antipolis, October 2018. Supervisors: J.-A. Désidéri and F. Poirion (ONERA Châtillon).

PhD defended in December 2018: A. Azaouzi, *isogeometric analysis methods for hyperbolic systems*, ENIT (Tunisia) / University of Nice - Sophia Antipolis, Oct. 2018. Supervisors: R. Duvigneau and M. Moakher (ENIT).

PhD defended in November 2018 : Sosina Mengistu-Gashaw (EURECOM), *Mobility and connectivity modelling of 2-wheels traffic for ITS applications* , March 2015. Supervisors: P. Goatin and J. Härri (EURECOM).

PhD defended in September 2018: 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 defended in July 2018: C. Fiorini, *Sensitivity equation method for hyperbolic systems*, Univ. Versailles, Oct. 2014. Supervisors: R. Duvigneau, C. Chalons (Univ. Versailles).

PhD in progress: S. Pezzano, *Isogeometric analysis with moving grids*, Univ. Nice Sophia-Antipolis. Supervisor: R. Duvigneau.

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

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

PhD in progress : Nikodem Dymski (Maria Curie Sklodowska 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

- R. Duvigneau was member of the committee of P. Ploe's PhD thesis *"Surrogate based optimization of hydrofoil shapes using RANS simulations"*, Ecole Centrale de Nantes, June 26th, 2018.
- R. Duvigneau was member of the committee of F. Mastrippolito's PhD thesis *"Optimisation de forme numérique de problèmes multiphysiques et multiéchelles : application aux échangeurs de chaleur"*, Ecole Centrale de Lyon, December 14th, 2018.
- P. Goatin was referee of M. Pfirsching's PhD thesis *"A multi-scale model for material flow problems based on a non-local conservation law: simulation and optimization"*, Universität Mannheim, April 11th, 2018.
- J.-A. Désidéri was referee of T. Achard's PhD. Thesis *Techniques de calcul du gradient aéro-structure haute-fidélité pour l'optimisation de voilures flexibles* (Techniques for computing the high-fidelity aero-structural gradient for the optimization of flexible wings), CNAM, Paris, December 2017.
- J.-A. Désidéri was a member of the jury of J. Mas Colomer's Phd. Thesis *Similitude Aéroélastique d'un Démonstrateur en Vol via l'Optimisation Multidisciplinaire* (Aeroelastic similarity of a Flight Demonstrator via Multidisciplinary Optimization), University of Toulouse, December 2018.

9.3. Popularization

9.3.1. Articles and contents

- Press article: *Dossier. Cette mathématicienne met le trafic en équation pour réduire les embouteillages*, Nice Matin, August 2018 (P. Goatin).
- TV interview for the program "Dimanche en politique", France 3 Côte d'Azur channel, October 14, 2018 (P. Goatin).

CAGIRE Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

- 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. Organization of the next workshop to be held at the Jožef Stefan Institute in Ljubljana, Slovenia in 2019.
- Scientific chair of the mini-symposium on Hybrid RANS/LES methods of the Fluids Engineering Division Summer Meeting(FEDSM) of ASME held in Montreal in 2018 [RM].

10.1.1.2. Member of the Organizing Committees

- Organizer and scientific chair of the mini-symposium on numerical schemes for compressible flows at low Mach number at CANUM 2018 [JJ].

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

- Intl Symp. Turbulence, Heat and Mass Transfer [RM]

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- Visualization of Mechanical Processes [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 2018, the team members reviewed 22 papers for the following journals:

- Aerospace Science and Technology (3) [PB]
- AIAA Journal (2) [PB,RM]
- Computational Thermal Sciences (1) [PB]
- Computers and Fluids (3) [RM,VP(2)]
- Energy and Buildings (1) [PB]
- Flow, Turbulence and Combustion (3) [RM]
- International Journal of Heat and Fluid flow (1) [RM]
- International Journal of Heat and Mass Transfer (2) [PB]
- Journal of Buildings Engineering (1) [PB]
- Journal of Petroleum Science and Engineering (1) [PB]
- Journal of Scientific Computing (1) [VP]
- Nuclear Engineering and Design (1) [RM]
- Physics of Fluids (1) [RM]
- Theoretical and Computational Fluid Dynamics (1) [RM]

10.1.4. Invited Talks

- P. Bruel [18]
- R. Manceau [10]

10.1.5. Research Administration

- Co-responsible for the organisation of the LMAP seminar of Mathematics and their Applications [JJ].
- Member of the LMAP council [JJ, PB].
- Member of the IPRA research federation scientific council [RM].

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Licence : [JJ], Research and innovation, 1h50, L1, Université de Pau et des Pays de l'Adour, Pau, France.

Licence : [JJ], Descriptive statistical, 24h, L1 - MIASHS, Université de Pau et des Pays de l'Adour, Pau, France.

Licence : [JJ], Scientific computing, 19h, L2 - Informatic, Université de Pau et des Pays de l'Adour, Pau, France.

Master : [JJ], Data analysis, 68h25, M1 - GP, Université de Pau et des Pays de l'Adour, Pau, France.

Master : [JJ], Tools for scientific computing, 48h75, M1 - MMS-MSID, Université de Pau et des Pays de l'Adour, Pau, France.

Master : [JJ,VP], Finite volume methods for hyperbolic systems, 52h50, M2 - MMS , Université de Pau et des Pays de l'Adour, Pau, France.

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 in progress : Puneeth Bikkanahally Muni Reddy, "Modelling turbulent flows in natural convection regimes using hybrid RANS-LES approaches, UPPA, October 2018, Rémi Manceau.
- PhD in progress : Gaëtan Mangeon, "Advanced modelling of heat transfer for industrial configurations with or without accounting of the solid wall", UPPA, February 2017, Rémi Manceau.
- PhD in progress : Vladimir Duffal, "Hybrid RANS/LES modelling for unsteady loadings in turbulent flows", UPPA, November 2017, Rémi Manceau.
- PhD in progress : Hassan Al Afailal: "3D simulation of non-reactive internal aerodynamics of spark-ignition engines using an hybrid RANS/LES method", September 2017, Rémi Manceau.
- PhD in progress Saad Jameel : "Turbulence modelling in the mixed and natural convection regimes in the context of automotive applications", UPPA, February 2017, Rémi Manceau.
- PhD in progress : Gustave Sporschill, "Amélioration des modèles pour la turbulence. Applications à la prédiction des écoulements aérodynamiques", UPPA, May 2018, Rémi Manceau.

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):

- François Delassaux, "Modélisation instationnaire de l'aérodynamique externe automobile", Conservatoire National des Arts et Métiers, 20 December 2018. Supervisor: I. Mortazavi [RM, Referee]
- Loïc Jecker, "Prévision de la transition bypass à l'aide d'un modèle à énergie cinétique laminaire basé sur la dynamique des modes de Klebanoff", ONERA, 15 November 2018. Supervisor: G. Casalis [RM, Referee]
- PhD: R. Bizzari "Modélisation aérodynamique et thermique des plaques multiperforées en LES", Université de Toulouse, France, 5 November 2018. Supervisors: T. Poinsot and A. Dauptain. [PB]
- PhD: D. Maestro "Large eddy simulation of the interactions between flames and thermal phenomena : application to wall heat transfer and combustion control" Université de Toulouse, France, 27 September 2018. Supervisors: T. Poinsot et G. Staffelbach. [PB, Referee]
- Cédric Uribe, "Développement d'une approche ZDES à deux équations de transport et application turbomachines", Sorbonne Université/ONERA, 24 September 2018. Supervisor: G. Gerolymos [RM, Referee]
- PhD: Valentin Bonnifet, "Prédiction du phénomène de tremblement sur un profil d'aile avec une approche LES de type PANS-RSM", Sorbonne Université, 19 September 2018. Supervisor: I. Vallet [RM, Referee]
- PhD: F. Guillois "Simulation d'une zone de mélange turbulente issue de l'instabilité de Richtmyer-Meshkov à l'aide d'un modèle à fonction de densité de probabilité – Analyse du transport de l'énergie turbulente", Université de Lyon, France, 7 September 2018. Supervisors: S. Simoëns and V.A. Sabel'nikov. [PB, Referee]
- PhD: Q. Douasbin "Acoustic waves in combustion devices : interactions with flames and boundary conditions", Université de Toulouse, France, 30 March 2018. Supervisors: T. Poinsot and L. Selle. [PB, Referee]
- PhD: B. P. Trevisan "Estudo experimental da interaçao turbulênca, combustão e acústica aplicada a motores aeroespaciais", INPE, São José dos Campos, Brazil, 28 February 2018. Supervisor: W.M.C. Dourado. [PB]

10.3. Popularization

10.3.1. Internal or external Inria responsibilities

- Vincent Perrier is a member of the CUMI-R.
- Vincent Perrier is a member of the CDT, in charge of the evaluation of software projects at the Inria Bordeaux center.
- Vincent Perrier is an elected member of the CLHSCT.
- Vincent Perrier is an elected member of the Inria evaluation committee. [0]
- Vincent Perrier is a member of the CT3-Num committee of Pau University, in charge of managing the computing resources and projects at Pau University.

10.3.2. Interventions

- «Forum des Métiers» organized by Collège Pierre Emmanuel, Pau (64), France, 9 February 2018. A stand was manned during one day with the objective of explaining the activity of researcher to an audience of middle school students. [PB]
- «Savoir en Partage», organized by Lacq Odyssée. [PB [22], JJ and VP [27], [24], RM [29], [28]]
- «Café des Sciences». [PB [23], JJ, RM [30], VP [25]]
- «Fête de la Science - Journée Portes Ouvertes Centre Inria BSO», Talence, France, 13 October 2018. [PB]
- «10 ans du centre Inria BSO: célébration de 10 ans de recherche et de transfert», Talence, France, 28 September 2018. [JJ and VP]

10.3.3. Creation of media or tools for science outreach

- «Science on tourne». [PB, JJ, RM, VP]

  http://www.cestdanslaire.fr/fr/page/science-on-tourne

[0] https://www.inria.fr/en/institute/organisation/committees/evaluation-committee

CARDAMOM 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

Mathieu Colin is a member of the scientific committee of the JEF day's.

10.1.2. Journal

10.1.2.1. Member of the Editorial Boards

- Mathieu Colin is a member of the board of the journal Applications and Applied Mathematics: An International Journal (AAM)
- P.M. Congedo is Editor of Mathematics and Computers in Simulation, MATCOM (Elsevier)
- Mario Ricchiuto is member of the editorial board of *Computers & Fluids (Elsevier)*, and of *Water Waves: An interdisciplinary journal (Springer)*

10.1.2.2. Reviewer - Reviewing Activities

We reviewed papers for top international journals in the main scientific themes of the team : Journal of Computational Physics, Optimization and Engineering, Computer Methods in Applied Mechanics 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, Computational and Applied Mathematics, Communications in Computational Physics, Coastal Engineering Journal, Journal of Hydraulic Research, 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.

10.1.3. Invited Talks

Mario Ricchiuto has give a plenary talk at the 2018 edition of the Melosh Medal award, held at Duke University in April 2018.

10.1.4. Research Administration

Mario Ricchiuto is member of the "bureau du comité des projets" of the Inria BSO center, as representative of the theme *Modelling, High-Performance Computing and Parallel Architecture*.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- License: Héloïse Beaugendre, Encadrement de projets sur la modélisation de la portance, 20h, L3, ENSEIRB-MATMÉCA, France
- Master : Héloïse Beaugendre, TD C++, 52h, M1, ENSEIRB-MATMÉCA, France
- Master : Héloïse Beaugendre, Calcul Haute Performance (OpenMP-MPI), 40h, M1, ENSEIRB-MATMÉCA et Université de Bordeaux, France
- Master : Héloïse Beaugendre, Responsable de filière de 3ème année, 15h, M2, ENSEIRB-MATMÉCA, France
- Master : Héloïse Beaugendre, Calcul parallèle (MPI), 39h, M2, ENSEIRB-MATMÉCA, France
- Master : Héloïse Beaugendre, Encadrement de projets de la filière Calcul Haute Performance, 14h, M2, ENSEIRB-MATMÉCA, France
- Master : Héloïse Beaugendre, Co-organisatrice du Hackathon, Inria, PlaFRIM et CATIE sont organisateurs sur Bordeaux du Hacakathon GENCI, France
- Master : Héloïse Beaugendre, Encadrement de projets sur la modélisation de la pyrolyse, 20h, M1, ENSEIRB-MATMÉCA, France
- Master : Héloïse Beaugendre , Projet fin d'études, 4h, M2, ENSEIRB-MATMÉCA, FRANCE
- Master: Mario Ricchiuto, Multi-Physics, 36hETD in the last year of the ENSEIRB-MATMÉCA school
- Post-Graduate: Mario Ricchiuto, Modelling of free surface flows, 12hETD post-graduate level short-course at Duke University
- Master : Mathieu Colin : Integration, M1, 54h, ENSEIRB-MATMÉCA, FRANCE
- Master : Mathieu Colin : Fortran 90, M1, 44h, ENSEIRB-MATMÉCA, FRANCE
- Master : Mathieu Colin : PDE, M1, 30h, University of Bordeaux, FRANCE
- Master : Mathieu Colin : Analysis, L1, 47h, ENSEIRB-MATMÉCA, FRANCE
- Master : Mathieu Colin : projet professionnel and internship responsibility : 15 h, ENSEIRB-MATMÉCA, FRANCE
- Master : Mathieu Colin : Encadrement de projets TER, 20h, ENSEIRB-MATMÉCA, FRANCE
- Master : Mathieu Colin : responsable relation entreprise formation en alternance ENSEIRB-MATMECA (30h)
- Master : Mathieu Colin : suivi d'apprenti en entreprise (28h).

10.2.2. Supervision

Lin Xi, Asymptotic modelling of incompressible reactive flows in self-healing composites, defended in October 2018.

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

Cortesi Andrea, Predictive numerical simulation for rebuilding freestream conditions in atmospheric entry flows, defented in March 2018

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

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

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

Mickael Rivier, Optimization under uncertainties of complex systems, started in May 2017.

Elie Solai, Efficient virtual prototyping of the EVE expander using robust multi-fidelity optimization,started in October 2018

Sixtine Michel, Parallel Coastal flood simulations using adaptive high order schemes with re-meshing and mesh deformation, PhD started in November 2018

10.2.3. Juries

Mario Ricchiuto has contributed to the following theses defense:

- Stephane Glockner: HDR U. de Bordeaux, June 2018 (as reviewer)
- Xi Lin: PhD U. Bordeaux, October 2018 (as examiner)
- Evi Noviani: PhD U. de Poitiers, November 2018 (as president of the jury)
- Kevin Pons: PhD U. de Toulon, December 2018 (as reviewer)
- Paola Bacigaluppi: PhD Zurich University, December 2018 (as reviewer)

Mathieu Colin has contributed to the following theses defense :

- Xi Lin: PhD U. Bordeaux, October 2018 (as director)

10.3. Popularization

10.3.1. Interventions

- Héloïse Beaugendre has co-organized (with PlaFRIM and CATIE) the Bordeaux session of the HPC hackathon sponsored by GENCI. This coding competition is open to students and young reserachers and has taken place at the Inria BOS center in December (for more information see `https://www.inria.fr/centre/bordeaux/agenda/hackathon-du-hpc-genci`)
- Algiane Froehly (Mmg-Consortium) and Mario Ricchiuto have set up and animated the CARDAMOM stand during the event "Fête des 10 Ans", held on September 27th, and celebrating the 10 years of the Inria BSO center

DEFI Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. General Chair, Scientific Chair

- P. Congedo is General Chair of the CWI-Inria workshop at Inria Paris research centre in Paris on September 25, 26 2018.

10.1.2. Member of the Organizing Committees

- L. Chesnel co-organized the Journée de rentrée (2018) of the Centre de Mathématiques Appliquées of École Polytechnique.
- L. Chesnel co-organizes the seminar of the Centre de Mathématiques Appliquées of École Polytechnique.
- L. Chesnel co-organizes the joint seminar of the Inria teams Defi-M3DISIM-Poems.
- H. Haddar co-organized a minisymposium at waves conference, Karlsruhe, July 2018
- H. Haddar co-organized a minisymposium at the conference Inverse problems: modeling and simulation, Malta, May 2018
- H. haddar co-organized a minisymposium at the Faculty of DSIT of Ecole polytechnique, May 2018.
- J.R. Li is Co-organizer of the summer school Ecole d'Été France Excellence, Data science for document analysis and understanding sponsored by the French Embassy in China, 07/2018. 4 weeks.

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- G. Allaire is member of the editorial boards 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.
- P.M. Congedo is Editor of Mathematics and Computers in Simulation, MATCOM (Elsevier).
- H. Haddar is
  - Member the editorial board of Inverse Problems
  - Associate Editor of the SIAM Journal on Scientific Computing
  - Guest editor of for a special issue in the journal Inverse Problems

10.1.3.2. Reviewer - Reviewing Activities

We reviewed papers for top international journals in the main scientific themes of the team.

10.1.4. Invited Talks

- G. Allaire
  - Seminar at BCAM, Bilbao (january 2018).
  - Séminaire JOFA, Pau (juin 2018).
  - ECCM-ECFD, ECCOMAS, Glasgow (juin 2018).
  - Summer school Sendai, Japon (August 2018).
  - Fifth workshop on thin structures, Naples, September 13-15, 2018.
  - Current trends and open problems in computational solid mechanics, Hannover, October 8-9, 2018.
- L. Chesnel
  - Conference on Mathematics of Wave Phenomena, July 2018.
  - SIAM conference on imaging science, Bologna, June 2018.
  - Inverse problems: modeling and simulation, Malta, May 2018.
  - Workshop du GDR ondes, Jussieu, March 2018.
- P.M. Congedo
  - von Karman Institute Symposium, Bruxelles, April 2018.
  - CERFACS Seminar, Toulouse, October 2018
  - VKI Lecture Series on Uncertainty Quantification, Bruxelles, September 2018.
  - Seminar at CEA-CESTA, Le Barp, September 2018.
- H. Haddar
  - ICAV conference, Hammamet, March 2018
  - SIAM conference on imaging science, Bologna, June 2018.
  - Waves conference, Karsruhe, July 2018
  - Seminar at LJK, Grenoble, October 2018
  - Kickoff workshop of Mecawave, November 2018
  - Workshop "Inverse Problems: Theory and Applications", Reims, 2018

10.1.5. Leadership within the Scientific Community

- G. Allaire is a board member of Institut Henri Poincaré (IHP). He is the chairman of the scientific council of IFPEN (French Petroleum Institute and New Energies). He is the chairman of the scientific council of AMIES (Agency for Interaction in Mathematics with Business and Society).

10.1.6. Scientific Expertise

- G. Allaire is a member of th"comité national" CNRS, section 41 (mathematics).
- G. Allaire is a member of the scientific board of the Gaspard Monge program on optimization (PGMO) at the Jacques Hadamard Mathematical Foundation.
- J.R. Li is Member of the SIAM Committee on Programs and Conferences 2017-2019.
- J.R. Li is Member Elu of Inria Commission d'Evaluation, 2015-present.

10.1.7. Research Administration

- J.R. Li is correspondant International for Centre de Mathematiques Appliquees, Ecole Polytechnique, 2018-present.
- J.R. Li is responsable for the Ecole Polytechnique part of the French-Vietnam Master Program in Applied Mathematics, 2016-present.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- Master: Grégoire Allaire, Approximation Numérique et Optimisation, for students in the second year of Ecole Polytechnique curriculum: 8 lessons of 1h30.
- Master: Grégoire Allaire, Transport and diffusion, for students in the third year of Ecole Polytechnique curriculum. 9 lessons of 2h jointly with F. Golse.
- Master: Houssem Haddar, Approximation Numérique et Optimisation, for students in the second year of Ecole Polytechnique curriculum: 8 TDs of 4h.
- Master: Houssem Haddar, Waves and imaging: Concepts, Theory and Applications, Master M2 "mathematical modeling": 9 lessons of 3h.
- Master: Lucas Chesnel, Variational analysis for partial differential equations, for students in the second year of Ecole Polytechnique curriculum: 8 TDs of 4h.
- Master: Lucas Chesnel, Numerical approximation and optimisation, for students in the second year of Ecole Polytechnique curriculum: 2 TDs of 4h + one project.
- Master: Lucas Chesnel, Modal Modélisation mathématique par la démarche expérimentale, for students in the second year of Ecole Polytechnique curriculum: 5 TDs of 2h.
- Master: Grégoire Allaire, Optimal design of structures, for students in the third year of Ecole Polytechnique curriculum. 9 lessons of 1h30.
- Master: Grégoire Allaire, Theoretical and numerical analysis of hyperbolic systems of conservation laws, Master M2 "mathematical modeling", 8 lessons of 3h.
- Master: Jing Rebecca Li, Lecturer of course Mathematical and numerical foundations of modeling and simulation using partial differential equations French-Vietnam Master in Applied Mathematics, University of Science, Ho Chi Minh City, 10/2018. 2 weeks.
- Master: P.M. Congedo, Numerical methods in Fluid Mechanics, ENSTA ParisTech, 12 h.
- Doctorat: Houssem Haddar, Lecturer at the kickoff workshop of GDR mecawave. Introduction to Inverse problems (2x1h30).
- Doctorat: P.M. Congedo, Introduction to Uncertainty Quantification, 12h, Doctorate School of University of Bordeaux, France.

10.2.2. Supervision

- Ph.D. A. Bissuel, Linearized Navier Stokes equations for optimization, floating and aeroaccoustic (Dassault Aviation, defended in January 2018). G. Allaire.
- Ph.D. P. Geoffroy, Topology optimization by the homogenization method in the context of additive manufacturing (defended in December 2018). G. Allaire.
- Ph.D. in progress: S. Houbar sur la cavitation dans le fluide caloporteur induite par les mouvements des assemblages d'un réacteur (CEA, to be defended in 2020). G. Allaire and G. Campioni.
- Ph.D. in progress: M. Boissier, Optimisation couplée de la topologie des formes et de la trajectoire de lasage en fabrication additive (to be defended in 2020). G. Allaire and Ch. Tournier.
- L. Rakotondrainibe sur l'optimisation des liaisons enre pièces dans les système mécaniques (Renault, to be defended in 2020). G. Allaire.
- F. Feppon sur l'optimisation topologique de systèmes couplés fluide-solide-thermique (Safran, to be defended in 2020). G. Allaire and Ch. Dapogny.
- Q. Feng sur les éléments finis multi-échelles pour Navier Stokes incompressible en milieu encombré (CEA, to be defended in 2019). G. Allaire and P. Omnes.
- J. Desai sur l'optimisation topologique de structures au comportement non-linéaire avec des méthodes de déformation de maillage (IRT SystemX, to be defended in 2021). G. Allaire and F. Jouve,

- Ph.D. in progress: B. Charfi, Identification of the sigular support of a GIBC, to be defended in 2019, H. Haddar and S. Chaabane
- PhD in progress: K. Napal, Transmission eigenvalues and non destructive testing of concrete like materials , to be defended in 2019, L. Chesnel H. Haddar and L. Audibert
- PhD in progress: M. Kchaou, Higher order homogenization tensors for DMRI modeling, to be defended in 2019, H. Haddar and M. Moakher
- PhD in progress: H. Girardon, Non destructive testing of PWR tubes using eddy current rotating coils, to be defended in 2021, H. Haddar and L. Audibert
- PhD in progress: J. Hao, Thesis topic: Algorithm and software development for analysis and classification of EEG measurements during administration of neuropsychological tests for AD/HD, 2017, J.R. Li and H. Rahioui. PhD stopped in Jan 2019.
- PhD in progress: M. Rihani, Maxwell's equations in presence of metamaterials (to be defended in 2021), A.-S. Bonnet-BenDhia and L. Chesnel.
- PhD in progress: F. Sanson, UQ in systems of solver for the atmospheric reentry (to be defended in July 2019), P.M. Congedo, O. Le Maitre.
- PhD in progress: N. Razaaly, Optimization under uncertainties of ORC turbine cascades, (to be defended in July 2019), P.M. Congedo.
- PhD in progress: M. Rivier, optimization under uncertainty through a Bounding-Box concept (to be defended in May 2020), P.M. Congedo.
- PhD in progress: Joao Reis, Advanced methods for stochastic elliptic PDEs (to be defended in October 2020), P.M. Congedo, O. Le Maitre.
- PhD in progress: G. Gori, Bayesian calibration of complex thermodynamic flows (to be defended in January 2019), P.M. Congedo, O. Le Maitre, A. Guardone.
- PhD in progress: Anabel Del Val, Advanced bayesian methods for aerospace applications (to be defended in October 2020), P.M. Congedo, O. Le Maitre, O. Chazot, T. Magin.
- PhD in progress: J. Carlier, Residual distribution schemes for cavitating two-phase flows (to be defended in October 2019), P.M. Congedo, M. Pelanti, R. Abgrall.
- PhD in progress: P. Novello, Deep learning for reentry atmosperic flows (to be defended in November 2021), P.M. Congedo, D. Lugato, G. Poette.
- PhD in progress: E. Solai, Virtual Prototyping of the EVE expander (to be defended in October 2021), P.M. Congedo, H. Beaugendre.

10.3. Popularization

10.3.1. Internal or external Inria responsibilities

- P.M. Congedo is Deputy Coordinator of "Maths/Engineering" Program of the Labex Mathématiques Hadamard.
- J.R. Li is Member Elu of Inria Commission d'Evaluation, 2015-present.

10.3.2. Internal action

- L. Chesnel provided some numerical experiments used in the exhibition "Rencontres diffractantes : quand les mathématiques inspirent l'art...". This exhibition was presented at Ensta ParisTech and at Inria Saclay.
- P.M. Congedo presented some research activities in aerospace in the context of UnithéauCafé du centre Inria de Saclay Ile-de-France.
- P.M. Congedo made a presentation in the context of the Fete de la science 2018, to several groups of young students (around 10-12 years old).
- H. Haddar made a joint presentation with O. Bunau from Xenocs on nanoparticle imaging using small angle X-ray diffraction technology in the context of UnithéauCafé at Inria de Saclay Ile-de-France.

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 commitee of the EuroAD Workshops on Algorithmic Differentiation (http://www.autodiff.org).

9.1.2. Scientific Expertise

Alain Dervieux is Scientific Director for the LEMMA company.

9.2. Teaching - Supervision - Juries

9.2.1. Supervision

PhD : Éléonore Gauci, “Goal-oriented metric-based mesh adaptation for unsteady CFD simulations involving moving geometries”, defended december 12, co-advisor A. Dervieux

ELAN Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Member of the Conference Program Committees

- Florence Bertails-Descoubes, member of the ACM SIGGRAPH Technical Program Committee in 2018 and 2019, and the Eurographics Technical Program Committee in 2018 and 2019.

8.1.2. Journal

8.1.2.1. Reviewer - Reviewing Activities

- Florence Bertails-Descoubes, Reviewer in 2018 for ACM Transaction on Graphics, ACM SIGGRAPH Asia 2018, Soft Matter, Royal Society Open Science.

8.1.3. Invited Talks

- Florence Bertails-Descoubes, invited talk at IUSTI, Marseille, June 2018 (contact: O. Pouliquen, équipe Écoulements de Particules).

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

Licence : Raphaël Charrondière, Calcul matriciel et fonctions de plusieurs variables, 36h éq TD, L2, Université Grenoble Alpes

Licence : Florence Bertails-Descoubes, Méthodes Numériques, 18h éq TD, L3, ENSIMAG 1A, Grenoble INP.

8.2.2. Supervision

PhD in progress : Mickaël Ly, Static inverse modelling of cloth, 01 octobre 2017, Florence Bertails-Descoubes and Mélina Skouras.

PhD in progress : Haroon Rasheed, Inverse dynamic modeling of cloth, 01 novembre 2017, Florence Bertails-Descoubes, Jean-Sébastien Franco, and Stefanie Wuhrer

PhD in progress : Raphaël Charrondière, Modeling and numerical simulation of elastic inextensible surfaces, 01 septembre 2018, Florence Bertails-Descoubes and Sébastien Neukirch.

8.2.3. Juries

Florence Bertails-Descoubes, member (Rapportrice) of Ph.D. Thesis committee of E. Cottenceau (10 avril 2018), ENSAM Lille (directeur de thèse : O. Thomas)

Florence Bertails-Descoubes, member (Rapportrice) of Ph.D. Thesis committee of S. Salamone (4 juillet 2018), Institut Charles Sadron à l'Université de Strasbourg (directeur de thèse : T. Charitat)

Florence Bertails-Descoubes, member (Rapportrice) of Ph.D. Thesis committee of S. Poincloux (15 octobre 2018), Laboratoire de Physique Statistique de l'ENS Paris (directeurs de thèse : F. Léchenault et M. Adda-Bedia).

8.3. Popularization

8.3.1. Articles and contents

- Interview about our past work on hair and cloth for a press article in Dauphiné Libéré des Enfants in November 2018.
- Press interview about our SIGGRAPH Asia paper on inverse shell design for an ACM Press Release in November 2018.

GAMMA3 Project-Team (section vide)

MATHERIALS Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

E. Cancès

- is the director of CERMICS, the Applied Mathematics department at École des Ponts,
- is a member of the editorial boards of Mathematical Modelling and Numerical Analysis (2006-), SIAM Journal of Scientific Computing (2008-), SIAM Multiscale Modeling and Simulation (2012-), and the Journal of Computational Mathematics (2017-),
- has co-organized an Oberwolfach workshop (March), an IMA workshop (March), the 2018 SIAM MS conference (July), and an ISCD summer school (July - August),
- was a member of the DFG Review Panel “Mathematics” for Clusters of Excellence, Cologne, April.

V. Ehrlacher

- is a member of the “Conseil d’Enseignement et de Recherche” of Ecole des Ponts,
- has co-organized the GdR MASCOT-NUM Working meeting on “Uncertainty quantification in materials science”, at IHP, May (with J. Baccou, J. Reygner and G. Perrin).

G. Ferré and J. Roussel have co-organized the working group J-PSI (Jeunes chercheurs en physique statistique et interactions, until July) at IHP. The working group was provided financial support from the SMAI through a BOUM grant, and ended with a one-day conference in June at Inria Paris.

C. Le Bris 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-), Journal de Mathématiques Pures et Appliquées (2009-), Pure and Applied Analysis (2018-). 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 (until September),
- the “International Scientific Advisory Committee” of the Centre de Recherche Mathématique, Université de Montréal (until mid-2018),
- 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,
- the “Conseil de la Faculté des sciences et ingénierie”, Sorbonne Université.

He is the president of the scientific advisory board of the Institut des Sciences du calcul et des données, Sorbonne Université. 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: Proceedings and Surveys (2012-),
- is a member of the ANR committee CES-40 "mathématiques et informatique".

T. Lelièvre

- is editor-in-chief of ESAIM: Proceedings and Surveys (with D. Chafai, C. Imbert and P. Lafitte),
- is a member of the editorial boards of IMA: Journal of Numerical Analysis and SIAM/ASA Journal of Uncertainty Quantification,
- is a member of the "Conseil d'Administration" of SMAI and École des Ponts,

Together with G. Stoltz, they have

- co-organized the Workshop "Advances in Computational Statistical Physics", CIRM, September (with G. Pavliotis),
- co-organized the CECAM discussion meeting "Coarse-graining with Machine Learning in molecular dynamics", Sanofi Campus Gentilly, December (with P. Gkeka, P. Monmarché).

G. Stoltz

- is a member of the scientific council of UNIT (Université Numérique Ingénierie et Technologie),
- co-organized with C. Robert the workshop "Computational Statistics and Molecular Simulation: A Practical Cross-Fertilization" (BIRS-Oaxaca, November),
- co-organizes the working group "Machine learning and optimization" of the Labex Bezout (with W. Hachel and R. Elie).

9.1.1. Conference participation

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

- S. Boyaval, weekly seminar of Laboratoire Jean Kuntzmann, Grenoble, February,
- S. Boyaval, GDR EGRIN annual meeting, Clermont-Ferrand, June,
- S. Boyaval, La Trobe University – Kyushu University joint Industrial Math seminar, Melbourne, September,
- E. Cancès, Energy and forces workshop, Cambridge, UK, January,
- E. Cancès, workshop "Mathematical models and computation of nonlinear problems", China, January,
- E. Cancès, weekly seminar of the mathematics department, Sapienza University of Rome, February,
- E. Cancès, weekly seminar of Maison de la Simulation, Saclay, March,
- E. Cancès, 2D materials workshop, Minneapolis, March,
- E. Cancès, Fields Institute workshop, Toronto, May,
- E. Cancès, workshop on computational mathematics, Suzhou, China, June,
- E. Cancès, Centre Henri Lebesgue workshop, Rennes, June,
- E. Cancès, SIAM Materials Science conference, Portland, July,
- E. Cancès, IPAM workshop, Los Angeles, August,
- E. Cancès, GAMM workshop, Aachen, September,
- E. Cancès, Franco-German Meeting Workshop on Mathematical Aspects in Computational Chemistry, Aachen, September,
- E. Cancès, CECAM workshop, Lausanne, November,
- E. Cancès, workshop "Big data challenges for predictive modeling of complex systems", Hong Kong, November,
- V. Ehrlacher, Groupe de travail ENS Rennes, January,
- V. Ehrlacher, workshop on "Mathematical Methods in Quantum Chemistry", Oberwolfach, Germany, March,
- V. Ehrlacher, Séminaire DEFI-MEDISIM-POEMS, October,

- G. Ferré, CERMICS PhD Seminar, Paris, February,
- G. Ferré, Les probabilités de demain, IHP, Paris, March,
- G. Ferré, Congrès National d'Analyse Numérique, Cap d'Agde, May,
- G. Ferré, International Conference in Monte Carlo and Quasi Monte Carlo Methods in Scientific Computing, Rennes, July,
- G. Ferré, SIAM Materials Science conference, Portland, July (two talks),
- G. Ferré, Franco-German Meeting Workshop on Mathematical Aspects in Computational Chemistry, Aachen, September,
- G. Ferré, Student Probability Seminar, Courant Institute of Mathematical Science, New-York, December,
- M. Josien, CANUM conference, Cap d'Agde, May,
- M. Josien, SIAM Materials Science, Portland, USA, July,
- F. Hédin, "PinT 7th Workshop on Parallel-in-Time methods", Roscoff Marine Station, France, May,
- F. Hédin, "CECAM Workshop, Frontiers of coarse graining in molecular dynamics", Zuse Institute Berlin, Germany, July,
- F. Hédin, CIRM Conference "Advances in Computational Statistical Physics", September,
- C. Le Bris, Séminaire Pierre-Louis Lions, Collège de France, January,
- C. Le Bris, Applied Mathematics Colloquium of the University of Maryland, February,
- C. Le Bris, PDE seminar, University of Chicago, April,
- C. Le Bris, Journées de l'Ecole Doctorale Carnot-Pasteur, Université de Besançon, June,
- C. Le Bris, Journées Scientifiques de Marcoule, CEA Marcoule, June,
- C. Le Bris, Journées de Cadarache, CEA Cadarache, June,
- C. Le Bris, (plenary lecture) 25th International Conference on Domain Decomposition Methods, St. John's, Canada, July,
- C. Le Bris, LMS Durham Research Symposium on Homogenization in Disordered Media, Durham, UK, August,
- C. Le Bris, Groupe de travail Calcul des Variations Paris-Ile de France, November
- F. Legoll, EMMC conference, Nantes, March,
- F. Legoll, University of Chicago, CAMP seminar, Chicago, USA, May,
- F. Legoll, AIMS conference, Taipei, Taiwan, July,
- F. Legoll, NumDiff conference, Halle, Germany, September,
- T. Lelièvre, Journée de l'ANR CINE-PARA, Université Paris 13, January,
- T. Lelièvre, Workshop "Interplay of Analysis and Probability in Applied Mathematics", Oberwolfach, Feburary,
- T. Lelièvre, Séminaire de la Maison de la Simulation, Saclay, March,
- T. Lelièvre, Séminaire du LJK, Grenoble, March,
- T. Lelièvre, Séminaire Statistical Machine Learning in Paris, Paris, April,
- T. Lelièvre, Workshop "Data-driven modelling of complex systems", ATI, London, May,
- T. Lelièvre, Workshop "Uncertainty quantification in materials science", IHP, Paris, May,
- T. Lelièvre, Séminaire Mathématiques pour l'Industrie et la Physique, Toulouse, May,
- T. Lelièvre, Fields Institute, "Focus Program on Nanoscale Systems and Coupled Phenomena: Mathematical Analysis, Modeling, and Applications", Toronto, May,
- T. Lelièvre, Workshop "Simulation and probability: recent trends", Rennes, June,

- T. Lelièvre, Workshop "Particle based methods", ICMS, Edinburgh, July,
- T. Lelièvre, CECAM workshop "Frontiers of coarse graining in molecular dynamics", Berlin, July,
- T. Lelièvre, Franco-German Workshop on mathematical aspects in computational chemistry, Aachen, September,
- T. Lelièvre, Séminaire "Simulation, Incertitudes et Méta-modèles", CEA Saclay, October,
- T. Lelièvre, Workshop "Computational Statistics and Molecular Simulation: A Practical Cross-Fertilization", Oaxaca, November,
- T. Lelièvre, Groupe de travail Évolution de Populations et Systèmes de Particules en Interaction, Ecole Polytechnique, December,
- A. Levitt, Mathematical Methods in Quantum Chemistry, Oberwolfach, March,
- A. Levitt, Analytical & Numerical Methods in Quantum Transport, Aalborg, May,
- A. Levitt, Beijing Normal University seminar, June,
- A. Levitt, Chinese Academy of Sciences seminar, June,
- A. Levitt, Franco-German Meeting Workshop on Mathematical Aspects in Computational Chemistry, Aachen September,
- P.-L. Rothé, PhD seminar, Inria Paris, June,
- J. Roussel, SIAM Materials Science conference, Portland, July,
- J. Roussel, Monte Carlo & Quasi-Monte Carlo Methods conference, Rennes, France, July,
- L. Silva Lopes, CECAM Coarse Graining Workshop, Berlin, Germany, July,
- L. Silva Lopes, Advances in Computational Statistical Physics, Marseille, September,
- S. Siraj-Dine, SIAM Materials Science conference, Portland, July,
- G. Stoltz, Seminar of the polymer physics group, ETH Zürich, February,
- G. Stoltz, Applied mathematics seminar Duke University, Durham, North Carolina, USA, February,
- G. Stoltz, Statistical Machine Learning in Paris seminar, Paris, April,
- G. Stoltz, Focus Program on Nanoscale Systems and Coupled Phenomena: Mathematical Analysis, Modeling, and Applications, Fields institute, Toronto, Canada, May,
- G. Stoltz, Journées scientifiques Inria, Bordeaux, France, June,
- G. Stoltz, Applied mathematics seminar Courant Institute of Mathematical Sciences, New York, October,
- G. Stoltz, Inria-LJLL seminar, December,
- P. Terrier, Minerals, Metals & Materials Society Annual Meeting & Exhibition, Phoenix, March,
- P. Terrier, CANUM, Cap d'Adge, June.

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

- E. Cancès, Fourier transform and applications in quantum physics and chemistry, 9h, GDR CORREL spring school, Paris, April,
- E. Cancès, Optimization problems in molecular simulation, 12h, ISCD summer school, Roscoff, July,
- E. Cancès, Mathematical methods and numerical algorithms for quantum chemistry, 12h, MWM autumn school, Gelsenkirchen, October,
- C. Le Bris, Aziz Lectures, University of Maryland, College Park, February,
- C. Le Bris, Fields Institute Coxeter Lecture Series, Toronto, May,
- T. Lelièvre, Mini-school math/chemistry GDR CORREL, 9h, April,
- T. Lelièvre, Lectures on "Stochastic numerical methods and molecular dynamics simulations" (15h), Ecole d'été ISCD (Sorbonne Université), Roscoff, August.

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

- A. Lesage, Fifth workshop on thin structures, Naples, Italy, September,
- J. Roussel, Advances in Computational Statistical Physics, CIRM, Marseille, France, September,
- G. Ferré, Data-driven modelling of Complex Systems, Alan Turing Institute, London,
- G. Ferré, Simulation Aléatoire : problèmes actuels, Inria Rennes,
- G. Ferré, Advances in Computational Statistical physics, CIRM.

Members of the team have benefited from long-term stays in institutions abroad:

- G. Ferré, Courant Institute of Mathematical Science, New York University, New York, USA, October-November,
- P.-L. Rothé, Department of Applied Mathematics, University of Washington, Seattle, USA, April-May.

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

- G. Ferré YES'X Workshop, Scalable Statistics: Accuracy and computational complexity, March,
- M. Josien, Coxeter Lecture Series, Seminar talks, Toronto, Canada, May
- A. Lesage, CANUM conference, Cap d'Agde, May,
- A. Lesage, 6th European conference on computational mechanics, Glasgow, United Kingdom, June,
- M. Ramil, Perspectives en physique statistique computationnelle au CIRM (Centre International de Recherche Mathématiques), Marseille, September,
- M. Ramil, Journées Kolmogorov, Evry, September,
- M. Ramil, ANR EFI workshop, Lyon, November,
- P.-L. Rothé, 6th European conference on computational mechanics, Glasgow, United Kingdom, June,
- P.-L. Rothé, FreeFem++ days, Paris, December,
- S. Siraj-Dine, Workshop Mathematical Challenges in Quantum Mechanics, Rome, February,
- S. Siraj-Dine, Oberwolfach Workshop on Mathematical Methods in Quantum Chemistry, March,
- S. Siraj-Dine, ICMP XIX Congress on Mathematical Physics, Montréal, July.

9.1.2. Software development and contributions

- A. Levitt has implemented a method to construct maximally-localized Wannier functions for metals. A. Levitt and S. Siraj-Dine have implemented a method for the computation of Wannier functions of topological insulators. Both these methods are available at https://github.com/antoine-levitt/wannier.
- J. Roussel and G. Stoltz have restructured the SIMOL code, in particular separating core functions, routines for quantum simulations and advanced features for molecular dynamics, in order to obtain a simpler and more accessible base code. The code is available at https://gitlab.inria.fr/matherials/simol/.
- A first implementation of the Generalized Parallel Replica algorithm, developed by F. Hédin and T. Lelièvre, is available at https://gitlab.inria.fr/parallel-replica/gen.parRep. The objective of the gen.parRep software is to popularize the use of the Parallel Replica algorithm to biological systems. Molecular dynamics is performed by using external codes linked to this program such as OpenMM. This is the first publicly available implementation of the Generalized Parallel Replica method targeting frequently encountered metastable biochemical systems, such as conformational equilibria or dissociation of protein-ligand complexes. We refer to the preprint [22] for more details.

9.2. Teaching - Supervision - Juries

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

At École des Ponts 1st year (equivalent to L3):

- Analyse et calcul scientifique, 30h (A. Levitt, G. Stoltz),
- Équations aux dérivées partielles et éléments finis, 15h (F. Legoll, P.-L. Rothé),
- Hydraulique numérique, 15h (S. Boyaval),
- Mécanique quantique, 10h (E. Cancès, A. Levitt),
- Méthodes numériques pour les problèmes en grande dimension, 17h30 (V. Ehrlacher, S. Boyaval),
- Optimisation, 15h, L3 (A. Lesage, A. Levitt),
- Outils mathématiques pour l'ingénieur, 15h (E. Cancès, G. Ferré, F. Legoll, T. Lelièvre, P-L. Rothé),
- Probabilités, 27h (M. Ramil)
- Projets de première année, 15h (J. Roussel, P. Terrier),

At École des Ponts 2nd year (equivalent to M1):

- Analyse de Fourier, 15h (A. Levitt),
- Analyse spectrale et application aux Équations aux dérivées partielles, 36h (F. Legoll, V. Ehrlacher),
- Contrôle de systèmes dynamiques et équations aux dérivées partielles, 18h (E. Cancès),
- Projet du département IMI, 12h (G. Ferré, M. Ramil, J. Roussel, L. Silva Lopes),
- Projets Modéliser Programmer Simuler (T. Lelièvre),
- Simulation moléculaire en sciences des matériaux, 6h (A. Levitt),
- Statistics and data sciences, 24h (G. Stoltz).

At École des Ponts 3rd year (equivalent to M2):

- Méthodes de quantification des incertitudes en ingénierie, 18h (V. Ehrlacher),
- Remise à niveau: outils mathématiques, 6h (A. Lesage).

At the M2 "Mathématiques de la modélisation" of Sorbonne Université:

- Introduction à la physique statistique computationnelle, 20h (G. Stoltz),
- Méthodes numériques probabilistes, 24h (T. Lelièvre),
- Problèmes multiéchelles, aspects théoriques et numériques, 24h (F. Legoll),
- Théorie spectrale et variationnelle, 10h (E. Cancès).

At other institutions:

- Analyse variationnelle des équations aux dérivées partielles, 32h, École Polytechnique (T. Lelièvre),
- Aléatoire, 32h, École Polytechnique (T. Lelièvre),
- Maths 1 et 2, 9h, L3, École des Mines (A. Levitt, G. Stoltz),
- Mathématiques pour l'ingénieur, 36h, L2, UPEC (S. Siraj-Dine),
- Numerical methods for partial differential equations, 21h, University of Chicago (C. Le Bris).

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

- Amina Benaceur, Réduction de modèles en thermique et mécanique non-linéaires, Université Paris-Est, École des Ponts, defended on December 21th, 2018, supervised by A. Ern (CERMICS), co-supervised by V. Ehrlacher,
- Marc Josien, Etude mathématique et numérique de quelques modèles multi-échelles issus de la mécanique des matériaux, Université Paris-Est, École des Ponts, defended on November 20th, 2018, supervised by C. Le Bris,
- Julien Roussel, Analyse théorique et numérique de dynamiques non-réversibles en physique statistique computationnelle, Université Paris-Est, École des Ponts, defended on November 27th, 2018, supervised by G. Stoltz,
- Pierre Terrier, Reduced models for defect migration in metals, Université Paris-Est, École des Ponts and CEA Saclay, defended on December 19th, supervised by G. Stoltz and M. Athènes (CEA).

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

- Zineb Belkacemi, Machine learning techniques in molecular simulation, Université Paris-Est, Thèse CIFRE Sanofi, started November 1st, 2018, co-supervised by T. Lelièvre and G. Stoltz,
- Robert Benda, Multiscale modeling of functionalized nanotube networks for sensor applications, Ecole Polytechnique, started September 1st, 2018, supervised by E. Cancès and B. Lebental (École Polytechnique),
- Raed Blel, Monte Carlo methods and model redcution, started October 1st, 2018, supervised by V. Ehrlacher and T. Lelièvre,
- 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,
- Rafaël Coyaud, Méthodes numériques déterministes et stochastiques pour le transport optimal, Université Paris-Est, École des Ponts, started October 1st, 2017, supervised by A. Alfonsi (CERMICS) and co-supervised by V. Ehrlacher,
- Qiming Du, Mathematical analysis of splitting methods, École Doctorale Sciences Mathématiques de Paris Centre, started September 1st, 2016, supervised by A. Guyader (Sorbonne Université) and T. Lelièvre,
- Grégoire Ferré, Efficient sampling methods for nonequilibrium systems, Université Paris-Est, École des Ponts started October 1st, 2016, supervised by G. Stoltz,
- Adrien Lesage, Multi-scale methods for calculation and optimization of thin structures, started October 1st, 2017, supervised by F. Legoll, co-supervised by V. Ehrlacher and A. Lebée (École des Ponts),
- Sofiane Martel, Modélisation de la turbulence par mesures invariantes d'EDPS, Université Paris-Est, École des Ponts, started January 1st, 2017, supervised by S. Boyaval and co-supervised by J. Reygner (CERMICS),
- Pierre-Loïk Rothé, Numerical methods for the estimation of fluctuations in multi-scale materials and related problems, started October 1st, 2016, supervised by F. Legoll,
- Mouad Ramil, Metastability for interacting particle systems, started October 1st, 2017, supervised by T. Lelièvre and J. Reygner (CERMICS),
- Laura Silva Lopes, Numerical methods for simulating rare events in molecular dynamics, started October 1st, 2016, supervised by J. Hénin (IBPC) and T. Lelièvre,
- Sami Siraj-Dine, Modélisation mathématique des matériaux 2D, École des Ponts, started October 1st, 2017, supervised by E. Cancès, C. Fermanian and co-supervised by A. Levitt.

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

- E. Cancès, PhD of Marco Vanzini ("Auxiliary systems for observables: dynamical local connector approximation for electron addition and removal spectra"), defended at Ecole Polytechnique in January 2018,
- E. Cancès, PhD of Giovanna Marcelli ("A mathematical analysis of spin and charge transport in topological insulators"), defended at Sapienza University of Rome in February 2018,
- E. Cancès, PhD of Mi-Song Dupuy ("Analyse de la méthode projector augmented-wave pour les calculs de structure électronique en géométrie périodique"), defended at Université Paris Diderot in September 2018,
- E. Cancès, PhD of Carlo Marcati ("Discontinuous hp finite element methods for elliptic eigenvalue problems with singular potentials, with applications in quantum chemistry"), defended at Sorbonne Université in October 2018,
- V. Ehrlacher, PhD of Mi-Song Dupuy, ("Analyse de la méthode projector augmented-wave pour les calculs de structure électronique en géométrie périodique"), defended at Université Paris-Diderot in September 2018.

- V. Ehrlacher, PhD of Nicolas Cagniart, (“Quelques approches non linéaires en réduction de complexité”), defended at Sorbonne Université in November 2018,
- V. Ehrlacher, PhD of Jules Fauque, (“Modèle d’ordre réduit en mécanique du contact. Application à la simulation du comportement des combustibles nucléaires”), defended at Ecole des Mines de Paris in November 2018,
- V. Ehrlacher, PhD of Ahmad Al-Takash, (“Development of numerical methods to accelerate the prediction of the behavior of multiphysics under cyclic loading”), defended at ENSMA in November 2018,
- F. Legoll, PhD of Brian Staber (“Stochastic analysis, simulation and identification of hyperelastic constitutive equations”), defended at Université Paris-Est in June 2018,
- T. Lelièvre, PhD of Bob Pépin (“Time Averages of Diffusion Processes and Applications to Two-Timescale Problems”), défended at Université du Luxembourg, April 2018,
- T. Lelièvre, PhD of Michel Nowak (“Accelerating Monte Carlo particle transport with adaptively generated importance maps”), defended at Université Paris Saclay, September 2018,
- T. Lelièvre, PhD of Ze Lei (“Irreversible Markov Chains for Particle Systems and Spin Models: Mixing and Dynamical Scaling”), défended at Ecole Normale Supérieure, December 2018,
- G. Stoltz, PhD of Sabri Souguir (“Simulation numérique de l’initiation de la rupture à l’échelle atomique”), defended at Ecole des Ponts in November 2018.

9.3. Popularization

9.3.1. Internal or external Inria responsibilities

- A. Levitt is a member of the editorial board of Interstices, Inria’s popularization website.

9.3.2. Articles and contents

- E. Cancès has been interviewed in “La Jaune et La Rouge”, the journal of the alumni of Ecole Polytechnique, in January.

9.3.3. Internal actions

- C. Le Bris organized an open day at CERMICS in June for the administrative staff of École des Ponts.

MEMPHIS Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

The team organized a conference in honour of Charles-Henri Bruneau. Several scientific presentations have been given by his many collaborators and friends. This conference was organized over two half-days: the afternoon of September 13 and the morning of September 14. The presentations are in a 30-minute format. https://indico.math.cnrs.fr/event/3768/

The team organized a half-day workshop on numerical modelling of swimming on December 12th 2018. Participants: Patrick Babin (MRGM), Michel Bergmann, Afaf Bouharguane, Marie Couliou (ONERA), Hamid Kellay (LOMA), Angelo Iollo, Olivier Marquet (ONERA).

9.1.2. 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, SIAM journal on scientific computing, SIAM journal on uncertainty quantification, Advances in Computational Mathematics.

9.1.3. Invited Talks

Angelo Iollo was invited as plenary speaker to SIMAI 2018, https://ocs.simai.eu/index.php/SIMAIcongress/SIMAI2018.

Angelo Iollo was invited to Gran Sasso Science Institute for the *Intensive Week on Fluids and Waves*https://fluidsandwaves.wordpress.com/blog/

9.1.4. Scientific Expertise

Angelo Iollo is an expert for the European Union for the program FET OPEN.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Four members of the team are Professors or Assistant Professors at Bordeaux University and have teaching duties, which consist 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).

9.2.2. Supervision

PhD: Federico Tesser. *Parallel solver for the Poisson equation on a hierarchy of superimposed meshes, under a Python framework*, University of Bordeaux and Insubria University. 11/09/2018. Advisors: Michel Bergmann, Angelo Iollo.

PhD: Claire Taymans. *Solving Incompressible Navier-Stokes Equations on Octree grids : towards Application to Wind Turbine Blade Modelling*, University of Bordeaux. 28/09/2018. Advisors: Michel Bergmann, Angelo Iollo.

PhD: Baptiste Lambert. *Modelling and numerical simulation of interactions in particle-laden flows*, University of Bordeaux. 17/10/2018. Advisors: Michel Bergmann, Lisl Weynans.

PhD: Emanuela Abbate. *Numerical methods for the simulation of low-Mach phenomena in continuum mechanics*, University of Bordeaux and Insubria University. 19/12/2018. Advisors: Angelo Iollo, Gabriella Puppo.

PhD in progress: Michele Giuliano Carlino. *Fluid-structure models on Chimera grids.* 01/10/2018. Advisors: Michel Bergmann, Angelo Iollo.

PhD in progress: Sebastien Riffaud. *Convergence between data and numerical models.* Advisor: Angelo Iollo.

PhD in progress: Antoine Fondanèche. *Monolithic fluid-structure modeles on parallel hierarchical grids.* 01/09/2018. Advisor: Michel Bergmann, Angelo Iollo.

PhD in progress: Luis Ramos Benetti. *Monolithic fluid-structure modeles on parallel hierarchical grids.* 01/10/2017. Advisor: Michel Bergmann, Angelo Iollo.

PhD in progress: Mathias Braun. *Reduced-order modelling for increased resilience of water distribution networks*. 01/10/2015. Advisors: Angelo Iollo, Iraj Mortazavi, Olivier Piller.

PhD in progress: *Numerical simulation and modeling of zebra fish swimming for the study of human diseases of genetic and toxicological origin*. 01/10/2015. Advisors: Afaf Bouharguane, Patrick Babin.

9.2.3. Juries

Angelo Iollo has been reviewer of the PhD thesis of Nicola Pozzi *Numerical Modeling and Experimental Testing of a Pendulum Wave Energy Converter (PeWEC)*, Politecnico di Torino, DIMEAS, May 2018.

Tommaso Taddei has partecipated to the PhD thesis of Nicolas Cagniart *A few nonlinear approaches in model order reduction*, Sorbonne University, LJLL, November 2018.

9.3. Popularization

Afaf Bouharguane has presented her research at the event Unithé ou Café at Inria Bordeaux, November 2018.

Michel Bergmann, "Modéliser et optimiser les énergies renouvelables". Stand for the 10-th year anniversary of Inria Bordeaux South West centre, October 13th 2018.

MEPHYSTO-POST Team

6. Dissemination

6.1. Promoting Scientific Activities

6.1.1. Scientific Events Organisation

6.1.1.1. Member of the Organizing Committees

A. Hardy co-organized the "Semaine d'Etude Math-Entreprise Hauts de France 2018" (Lille).

6.1.2. Journal

6.1.2.1. Reviewer - Reviewing Activities

- S. De Bièvre served as reviewer for J. Math. Phys., Ann. Institut H. Poincaré, J. Stat. Phys. in 2018.
- G. Dujardin served as reviewer for APNUM and Numer. Math. in 2018.
- A. Hardy served as reviewer for Communications in Pure and Applied Mathematics and Annals of Applied Probability in 2018.
- M. Simon was reviewer for Markov Processes and Related Fields, and Annales de L'I.H.P. Probabilités et Statistiques in 2018.

6.1.3. Invited Talks

A. Hardy was invited to give several talks in 2018, including:

- (May 2018) Workshop "random matrices and their applications", Kyoto university (Japan)
- (April 2018) Groupe de travail "Probas du vendredi" de Jussieu, Paris
- A. Hardy was invited at a "réunion interne de l'Académie des Science" entitled "Le renouveau des processus ponctuels déterminantaux, des fermions à la statistique appliquée".

M. Simon was invited to give several talks in 2018, including:

- (April 2018) Workshop of the Simons Semester "PDE/SPDE-s, Functional Inequalities", Banach Center, Poznan (Poland)
- (August 2018) Journées "Modélisation Aléatoire et Statistique" of the "Société de Mathématiques Appliquées et Industrielles", Dijon (France)
- (November 2018) Weekly Probability Seminar at University of Bath (England)
- (December 2018) Weekly Probability Seminar in Lyon (France).

6.1.4. Research Administration

G. Dujardin is a member of Inria Evaluation Committee.

6.2. Teaching - Supervision - Juries

6.2.1. Teaching

Licence: G. Dujardin, "Calcul Différentiel et Intégral", 30h, L2, Université Libre de Bruxelles, Belgique.

Master: G. Dujardin, "Analyse Fonctionelle", 30h, M1, Université Libre de Bruxelles, Belgique.

Master: G. Dujardin, "Vortex dans les condensats de Bose–Einstein en rotation", 20h, M2, Université de Lille, France.

6.2.2. Supervision

HdR: Guillaume Dujardin, Contribution à l'analyse numérique de problèmes d'évolution : comportements asymptotiques et applications à l'équation de Schrödinger, Université de Lille, November 12th 2018 [3].

6.2.3. Juries

G. Dujardin and M. Simon participated in the jury of the "Agrégation externe de mathématiques" in 2018.

G. Dujardin took part in the hiring committees of Junior Scientists for Inria Paris, Inria Saclay and in the final admission committee in 2018.
M. Simon was member of the jury of the PhD thesis of J. Roussel which was defended in November 2018 at École des Ponts (Marne-la-Vallée, France) and is entitled *Theoretical and numerical analysis of non-reversible dynamics in computational statistical physics*.

6.3. Popularization

6.3.1. Interventions

- M. Simon participated in the local program “Chercheurs itinérants”, and gave several lectures directed to high-school students.

MINGUS Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. Member of the Organizing Committees

- F. Castella organized the workshop "Multiscale numerical methods", Saint-Malo, december 13-15 2017. [15 participants]
- P. Chartier, M. Lemou and F. Méhats organized the MOONRISE Workshop on "Numerical methods for multi-scale PDEs", Institut d'études scientifiques de Cargèse, Cargèse, France, September 3th-7th, 2018.
- P. Chartier, N. Crouseilles, M. Lemou and F. Méhats organized the workshop Henri Lebesgue Center on "Geometric and multi-scale methods for kinetic equations", Rennes, June 12th-15th, 2018.
- A. Crestetto organized the "journée d'analyse Rennes-Nantes", january 2018, ENS Rennes.
- A. Crestetto organized the workshop Henri Lebesgue Center on "mathematical models in health sciences".
- N. Crouseilles co-organized the weekly seminar "Mathematic and applications", ENS Rennes.
- A. Debussche organized the workshop on Stochastic partial differential equations, may 2018, CIRM, Marseille, France.

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

- N. Crouseilles was member of the scientific committee of the SMAI-2019 conference organized by the university of Nantes.
- E. Faou was head of organization of the semester *scientific computing* sponsored by the Labex Lebesgue (2 international summer schools, 7 workshops and international conferences), january-july 2018.

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- P. Chartier is member of the editorial committee of Mathematical Modelling and Numerical Analysis (M2AN).
- A. Debussche is editor in chief of Stochastic Partial Differential Equations: analysis and computations (2013-).
- A. Debussche is associate editor of Differential and Integral Equations (2002-2018).
- A. Debussche is associate editor of Potential Analysis (2011-2018).
- A. Debussche is associate editor of ESAIM:PROC (2012-).
- A. Debussche is associate editor of Journal of Evolution Equation (2014-).
- A. Debussche is associate editor of Applied Mathematics & Optimization (2014-).
- A. Debussche is associate editor of SIAM JUQ (2017-).
- A. Debussche is member of the editorial board of the collection "Mathématiques & Applications de la SMAI", Springer.
- M. Lemou is member of the editorial committee of "Communications in Mathematical Sciences" (CMS).

10.1.3.2. Reviewer - Reviewing Activities

The members of the IPSO team are reviewers for almost all the journals in which they publish (SIAM, JCP, CPDE, CMP, ARMA, JSP, JSC, JMAA, ANM, JCAM, NMPDE, Numer. Math., $\cdots$)

10.1.4. Invited Talks

- J. Bernier: invited speaker at the workshop "dynamics of Hamiltonian PDEs", february 2018, La Thuile, Italy.
- J. Bernier: invited speaker at the workshop "NABUCO", february 2018, Toulouse, France.
- P. Chartier: invited speaker at the 12th AIMS Conference on Dynamical Systems, Differential Equations and Application, July 5 - July 9, 2018 Taipei, Taiwan.
- A. Crestetto: invited speaker at the conference ABPDEIII, august 2018, Lille, France.
- A. Crestetto: invited speaker at the workshop on "Numerical Methods for Multiscale PDEs", september 2018, Cargèse, France.
- N. Crouseilles: invited talk at the Workshop Numerical Aspects of Hyperbolic Balance Laws and Related Problems, University of Ferrara, Italy, April 2018.
- N. Crouseilles: invited talk at the "Journée Scientifique Inria", june 27-28, Bordeaux, France.
- N. Crouseilles: invited speaker at the 12th AIMS Conference on Dynamical Systems, Differential Equations and Application, July 5 - July 9, 2018 Taipei, Taiwan.
- N. Crouseilles: invited speaker at the worskhop "Integrating the Integrators for Nonlinear Evolution Equations: from Analysis to Numerical Methods, High-Performance-Computing and Applications", december 2018, BIRS, Banff, Canada.
- A. Desbussche: invited speaker "Aziz lecture", university of Maryland, april 2018, USA.
- A. Desbussche: invited speaker at the "school on PDEs", Riemann international school of mathematics, july 2018, Varese, Italy.
- E. Faou: invited plenary speaker at the conference on "Mathematics of Wave Phenomena", august 2018, KIT Karlsruhe, Germany.
- E. Faou: invited speaker at the worskhop "Integrating the Integrators for Nonlinear Evolution Equations: from Analysis to Numerical Methods, High-Performance-Computing and Applications", december 2018, BIRS, Banff, Canada.
- M. Lemou: invited speaker at the 12th AIMS Conference on Dynamical Systems, Differential Equations and Application, July 5 - July 9, 2018 Taipei, Taiwan.
- M. Lemou: invited speaker at the Ki-Net Conference on "Mathematical and Numerical Aspects of Quantum Dynamics", June 19-21, 2018. CSCAMM, University of Maryland, USA.
- M. Lemou: invited speaker at "Premier Congrès Franco-Marocain de Mathématiques Appliquées", april 16-20 2018, Marrakech, Maroc.
- F. Méhats: invited talk at the Workshop Numerical Aspects of Hyperbolic Balance Laws and Related Problems, University of Ferrara, Italy, April 2018.
- F. Méhats: 7 hours mini course on Averaging Techniques, Colloque Inter' Actions, Lyon, May 2018.
- F. Méhats: talk at the day Space-Time Multiscale Methods (Atelier MePhy), Paris, June 2018.
- F. Méhats: talk at the University of Wisconsin, October 2018.
- F. Méhats: talk at a workshop on dispersive equations, October 2018.
- G. Morel: invited speaker at the Numkin workshop, october 2018, Max Planck Institute, Garching, Germany.
- P. Navaro: invited speaker at the CANUM 2018, France.
- P. Navaro: invited speaker at the IPL meeting, France.
- P. Navaro: invited speaker at the Finist'R meeting, France.
- X. Zhao: invited speaker at the workshop on "Numerics for cosmology - the Schrödinger method", may 22nd-25th 2018, WPI Vienna, Austria.

- X. Zhao: invited speaker at the workshop on "weak turbulence, kinetic problems and related", july 14-15 2018, Wuhan university, China.
- X. Zhao: invited speaker at the "Forum on modern challenges in modelling and numerics", july 20th-21st 2018, Beijing CSRC, China.
- X. Zhao: invited speaker at the "Modern Numerics on Nonlinear Wave and Dispersive Equations and Related Problems", august 8th-9th 2018, Chengdu university, China.
- X. Zhao: invited speaker at the Numkin workshop, october 2018, Max Planck Institute, Garching, Germany.
- X. Zhao: invited speaker at the workshop on "Numerical Methods for Multiscale PDEs", september 2018, Cargèse, France.

10.1.5. Scientific Expertise

- P. Chartier was member of the hiring committee CR2-Inria (Bordeaux).
- P. Chartier was member of the hiring committee the Inria promotion committee (DR1-DR0).
- A. Crestetto was member of the hiring committee AGPR-2018, ENS Rennes, France.
- A. Crestetto was the vice-head of the hiring committee of the MCF position, university of Nantes, France.
- A. Debussche was reviewer for Austrian Science Fundation (FWF).
- E. Faou is the member of the CNU 26.
- E. Faou was member of the hiring committee of the professor position, university of Dijon, France.

10.1.6. Research Administration

- F. Castella was member of the evaluation HCERES committee of the MICS laboratory (Centrale-Supélec).
- P. Chartier is the vice-head of science (DSA) of the Rennes Inria-Center until the end of 2018,
- P. Chartier is member of the national evaluation committee (CE) of Inria until the end of 2018.
- P. Chartier is member of the direction committee (ED) of the Rennes Inria-Center until the end of 2018
- P. Chartier is member of the G6-committee (bureau of the direction committee) Inria-Rennes-Bretagne-Atlantique center until the end of 2018.
- A. Crestetto is member of the mathematics department council, university of Nantes.
- A. Crestetto is member of the scientific council of the sciences unity, university of Nantes.
- A. Crestetto is the SMAI correspondent for the mathematics laboratory of Nantes.
- N. Crouseilles is member of the scientific council of ENS Rennes.
- N. Crouseilles is member of the mathematic laboratory (IRMAR) council.
- N. Crouseilles is member of the Fédération de Fusion council (University of Rennes representative).
- A. Debussche is member of the scientific council of the Fédération Denis Poisson.
- A. Debussche is member of the administrative council of ENS Paris-Saclay.
- A. Debussche if scientific vice-deputy and international relations of ENS Rennes.
- A. Debussche is vice-head ot the Centre Henri Lebesgue.
- A. Debussche is vice-head of the Lebesgue agency for Mathematic and Innovation.
- E. Faou is the AMIES correspondent for Inria Bretagne Atlantique.
- E. Faou is member of the scientific council of the Pôle Universitaire Léonard de Vinci.
- M. Lemou is the head of the IRMAR team "Analyse numérique" composed of 48 members.
- M. Lemou is member of the scientific council of ENS Rennes.

- M. Lemou is member of the scientific council of the LABEX Lebesgue.
- P. Navaro is member of the national network "calcul" http://calcul.math.cnrs.fr. This network is well known for interdisciplinarity of CNRS dedicated to technological aspects of scientific computing (programming, optimization, architectures, $\cdots$).

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Licence:

- P. Chartier: lecture "Ordinary differential equations" of the first year (Licence) of the Magistère, Ecole Normale Supérieure de Rennes (24 hours).
- N. Crouseilles: lecture on "Numerical methods" of L3, ENS Rennes (30h).

Master:

- F. Castella: lecture on "Numerical methods" of M1, University of Rennes 1 (50 hours).
- P. Chartier: lecture on "Numerical methods for kinetic equations" of the third year (M2) of the Magistère, University of Rennes 1 (12 hours).
- A. Crestetto: lecture on "Numerical methods for incompressible fluids" of M2, university of Nantes (62h).
- N. Crouseilles: lecture on "Numerical methods for PDEs" of M1, ENS Rennes (30h).
- E. Faou: lecture on "numerical integration of Hamiltonian PDEs" of M2, university of Rennes 1 (30h).
- M. Lemou: lecture on "elliptic PDEs" of the second year (M1) of the Magistère, University of Rennes 1 (36 hours).
- M. Lemou: lecture on "fundamental tools for PDEs" of the third year (M2) of the Magistère, University of Rennes 1 (12 hours).
- M. Lemou: lecture on "Numerical tools for kinetic equations" of the third year (M2) of the Magistère, University of Rennes 1 (12 hours).
- P. Navaro: lecture on "numerical tools for Big Data", master, university of Rennes 2.
- P. Navaro: lecture on "Python programming", master, ENSAI.

Doctorat:

- F. Casas: lecture for PhD students " A (very) Short Introduction to Geometric Numerical Integration and Splitting Methods", (4h).

10.2.2. Supervision

PhD: M. Fontaine, Modèles mathématiques de type HMF : stabilité et méthodes numériques autour d'états staionnaires, ENS Rennes, july 13th, advisors: M. Lemou and F. Méhats.

PhD: M. jugal Nguepedja Nankep, Modélisation stochastique de systèmes biologiques multi-échelles et inhomogènes en espace, ENS Rennes, march 22th, advisor: A. Debussche.

PhD in progress: J. Bernier, Mathematical and numerical anaysis of nonlinear transport equations, started in september 2016, advisors: N. Crouseilles and E. Faou.

PhD in progress: A. Rosello, "Approximation-diffusion pour des équations cinétiques pour les modèles de type spray", started in september 2016, advisors: A. Debussche and J. Vovelle (CNRS, Lyon).

PhD in progress: J. Massot, "Modélisation et simulation de plasmas chauds", started in october 2018, advisors: A. Crestetto (Nantes) and N. Crouseilles.

PhD in progress: L. Trémant, "Méthodes d'analyse asymptotique et d'approximation numérique de modèles dissipatifs multi-échelles : EDO à variété centrale et modèles cinétiques", started in october 2018, advisors: P. Chartier and M. Lemou.

10.2.3. Juries

- F. Castella: reviewer of the thesis and member of the PhD committee of P. Terrier (university of Paris Est and CEA).
- A. Crestetto: member of the PhD committee of the thesis of M. Stauffert (university of Versailles).
- N. Crouseilles: reviewer of the thesis and member of the PhD comittee of N. Bouzat (university of Strasbourg, Inria and CEA).
- N. Crouseilles: member of the PhD comittee of M. Malo (ENS Rennes).
- A. Debussche: reviewer of the HDR and member of the HDR committee of G. Dujardin (Inria, university of Lille).
- A. Debussche: member of the PhD committee of M. Tomasevic (university of Nice).
- A. Debussche: member of the PhD committee of P. Tsatsoulis (university of Warwick).
- E. Faou: reviewer of the thesis and member of the PhD committee of M.-S. Dupuy (university of Paris Diderot).
- E. Faou: member of the HDR committee of G. Dujardin (Inria, university of Lille).

10.3. Popularization

10.3.1. Interventions

- A. Crestetto: talks on "traffic flows" in several educational institutions within the framework of "Essentielles", university of Nantes.
- N. Crouseilles: welcoming of two schoolchildren at IRMAR laboratory.
- N. Crouseilles: welcoming of a student within the framework of the modulus "visit a researcher" (3 meetings).

10.3.2. Internal action

- P. Navaro: Python training (3 days) at the CNRS delegation of Lille, april 2018.
- P. Navaro: Python training (3 days) for the Rennes DSI, june 2018.

MOKAPLAN Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Scientific Events Organisation

8.1.1.1. Member of the Organizing Committees

- G. Carlier was in the organizing committee of the conference *Des mathématiques de la décision aux jeux à champ moyen* held in Honor of Jean-Michel Lasry at Dauphine in July 2018.
- T. O. Gallouët was in the organizing committee of the international conference *Modern mathematical methods for Data analysis* held at Liège (Belgium) in June 2018.
- F-X. Vialard was in the organizing committee of the December 2018 Banff, applied optimal transport, stochastic geometric mechanic and shapes conference.

8.1.2. Scientific Events Selection

8.1.2.1. Reviewer

V. Duval has reviewed contributions to the LVA/ICA conference.

8.1.3. Journal

8.1.3.1. Member of the Editorial Boards

G. Carlier is in the board of Journal de l'Ecole Polytechnique, Applied Mathematics and Optimization, Mathematics and Financial Economics and Journal of Dynamic Games (starting end of 2018).

8.1.3.2. Reviewer - Reviewing Activities

- V. Duval has reviewed papers for the following journals: *ESAIM COCV*, *IEEE Trans. on Signal Processing*, *Information and Inference: a Journal of the IMA*, *Math. Stat. Learning*, *SIIMS*, *Inverse Problems on Imaging*.
- J-D. Benamou has reviewed papers for the following journals: *SINUM*, *Numerische Math.*, ...
- T. O. Gallouët has reviewed papers for ARMA, ...
- P. Pegon has reviewed articles for Journal de Mathématiques Pures et Appliquées and Journal of Functional Analysis.
- F-X. Vialard has reviewed papers for Numerische Math., Siam IS, IEEE TMI, Siaga, P AMS.

8.1.4. Invited Talks

- I. Waldspurger gave talks at the Séminaire de mathématiques appliquées du collège de France, at the Mathematical Image Analysis conference (Berlin), at the Colloquium in Applied and Computational Mathematics of ETH Zurich, at the 7th international conference on computational harmonic analysis (Nashville) and at the SIAM conference on imaging science (Bologne).
- V. Duval has given invited talks at the MAGA workshop (Jan.), Journée Parcimonie Bordeaux of the GdR MIA (May), GdT StatNum at CEREMADE (May), SIAM Imaging Conference (June), ISMP Conference (July), Journées MAS (Aug.).
- J-D. Benamou has given invited talks at : Algebraic and geometric aspects of numerical methods for differential equations Workshop (Institut Mittag-Leffler, Djursholm), Workshop on Moving and Adaptative Meshes for Global Atmospheric Modelling (University of Reading), Gradient flows: challenges and new directions Workshop (ICMS, Edinburgh), Workshop on Monge-Ampère numerical resolution methods (TU Eindhoven), Shape Analysis, Stochastic Geometric Mechanics and Applied Optimal Transport (BIRS, Banff), MIGSAA Mini-Symposium in Optimal Transport and its Applications (University of Edimburgh).

- G. Carlier gave talks at TUM (Munich), workshop Optimisation and Machine Learning in Economics at UCL (Londres), workshop Entropies, the Geometry of Nonlinear Flows, and their Applications (Banff, Canada), SFB Colloquium, TUM, Munich, Workshop PDEs and optimal Transport (Essaouira), PDE seminar, Imperal College (Londres), Optimal Transport and Applications (Pise), ERC Readi closing conference (EHESS Paris).
- Y. De Castro has given invited talks at Société Mathématiques de France national conference, Ecole Normale Supérieure de Lyon, Oxford numerical analysis seminar (invited by Pr Tanner), Ecole des Ponts ParisTech, and Labex Bezout day.
- F-X. Vialard gave talks at siam Imaging Sciences in bologna june 2018, septembre 2018 Lisbonne workshop on optimal transport, geometric mechanics, october 2018, Labex Bézout, université paris-est and wasinvited to Mittag-Leffler institute for a conference on optimal transport, geometry and algebra.
- T. O. Gallouët gave talks at UPMC, Paris, Séminaire du Laboratoire Jacques-Louis Lions, ANR MAGA meeting, Paris and Workshop on New Developments in PDEs and Related Topics, Essaouira, Maroc.
- P. Pegon was invited for 10 days to Penn State College by Alberto Bressan in order to start a collaboration on the theory of ramified transport and applications to biology, and to give lectures (2) in the seminar series on Computational and Applied Mathematics.
- Andrea Natale gave the following talks:
  - Generalized H(div) geodesics and solutions of the Camassa-Holm equation. *BIRS Workshop: "Shape Analysis, Stochastic Geometric Mechanics and Applied Optimal Transport"*, 12/2018, Banff (Canada).
  - An optimal transport approach for the Camassa-Holm variational model. *Canadian Mathematical Society Winter Meeting*, 12/2018, Vancouver (Canada).
  - Generalized H(div) geodesics and solutions of the Camassa-Holm equation. *Oberwolfach Seminar: "Optimal Transport Theory and Hydrodynamics (from Euler to Monge and vice versa)"*, 10/2018, Oberwolfach (Germany).
  - Generalized H(div) geodesics and solutions of the Camassa-Holm equation. *MokaMeeting*, 12/2018, Inria Paris (France).

8.1.5. Research Administration

J-D. Benamou is a member of the *Commision de restauration locale*.

J-D. Benamou is the *Commission Bureau* referent for the 4th floor of building A.

J-D. Benamou is a member of PSL *Conseil Académique*.

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

Licence: I. Waldspurger, Analyse 1, 92 heures d'équivalent TD, L1, Université Paris Dauphine, France

Master: V. Duval, project supervision (M2), INSA de Rouen, France

Licence: T. O. Gallouët, Optimisation (TD, L3, Orsay), EDP (TD, 2 ème anné, ENS).

Master, Licence: G. Carlier taught algebra (Licence, Dauphine, 91h), transport and variational methods in economics (Dauphine, M2, 18h) and Convex duality and applications in mass transport and the calculus of variations in Munich (18h).

Licence: Y. De Castro taught optimization to first year engineering school student (10h).

Licence: A. Natale taught (TD) for the course "Calcul Différentiel et Optimisation" (Instructor: Emeric Bouin), 09-12/2018, Université Paris Dauphine, Paris (France).

Licence, Master: P. Pegon taught a crash course in analysis (M1, Dauphine, 12h), and gave exercise sessions in Measure theory and probability (L3, Dauphine, 39h) and on Functional Analysis and PDEs (M1, Dauphine, 19.5h).

8.2.2. Supervision

- PhD : Quentin Denoyelle, *Theoretical and Numerical Analysis of Super-Resolution without Grid*, defended on 09/07/2018, G. Peyré and V. Duval.
- PhD in progress : Gabriele Todeschi, Optimal transport and finite volumes, 01/10/2018, T. O. Gallouët.
- PhD in progress : Miao Yu , *Optimal Transport distances for Full Waveform Inversion*, 01/10/2016, J-D. Benamou.
- PhD in progress: Paul Catala, *Low-rank Approaches for Off-the-grid Superresolution*, 01/10/2016, G. Peyré and V. Duval.
- PhD in progress : Lucas Martinet , *Decomposed and Parallel Sinkhorn Algorithm for Optimal Transport*, 01/10/2017, J-D. Benamou.
- PhD in progress : Giorgi Rukhaia , *On the application of Sinkhorn methods in Freeform Optics*, 01/05/2018, J-D. Benamou.
- PhD in progress : Ernesto Araya , *Random Graphs*, Y. De Castro.

8.2.3. Juries

G. Carlier was in the HDR committee of Nicolas Juillet and in the Ph.D committees of Michael Orieux, Hadrien de March and Thomas Dumas

8.3. Popularization

8.3.1. Internal or external Inria responsibilities

V. Duval was a member of the *Commission d'évaluation scientifique* (CES) of the CRI Paris in 2018, and has been a member of the *Comité de suivi doctoral* since September 2018.

J-D. Benamou was a member of the *CR2 Recruiting Commission* of the CRI Paris in 2018.

8.3.2. Education

I. Waldspurger has given a talk at the Mathematic Park seminar (for L1 and L2 students), on the minimization of convex functions with Lipschitz gradient.

8.3.3. Interventions

Participation à l'accueil de 15 collégiens dans le cadre de leur stage d'observation (3 heures dans l'équipe MOKAPLAN supervisé par Lucas Martinet).

NACHOS Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

Stéphane Lanteri has chaired the second workshop of the CLIPhTON (advanCed numericaL modelIng for multiscale and multiphysics nanoPhoTONics) network that took place at Humboldt-Universität zu Berlin, Berlin, Germany, July 12-13, 2018.

9.1.2. Invited Talks

Claire Scheid, "A Discontinuous Galerkin Time-Domain framework for nanoplasmonics", Topical Workshop "Computational Aspects of Time Dependent Electromagnetic Wave Problems in Complex Materials", ICERM, Brown University, Providence, USA, June 25-29, 2018

Stéphane Lanteri, "Discontinuous Galerkin solvers for the numerical modeling of nanoscale light-matter interactions", MATHIAS 2018 - Computational Science Engineering & Data Science by TOTAL, Paris, October 22-24, 2018

Stéphane Lanteri, "Rigorous modeling of light absorption in nanostructured materials using a parallel high order finite element time-domain technique", Research Center for Advanced Science and Technology, The University of Tokyo, Japan, July, 30 2018

Stéphane Lanteri, "An upscaled DGTD method for time-domain electromagnetics", Special Session "Multiscale and multiphysics computation and applications", Progress In Electromagnetics Research Symposium - PIERS 2018, Toyama, Japan, August 1-4, 2018

9.1.3. Scientific Expertise

Stéphane Lanteri is a member of the Scientific Committee of CERFACS.

9.1.4. Research Administration

Stéphane Lanteri is a member of the Project-team Committee's Bureau of the Inria Sophia Antipolis-Méditerranée research center.

Stéphane Lanteri is a member of the Sciences Fondamentales et Appliquées Doctoral School Committee (until December 2018).

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Stéphane Descombes, *Scientific computing*, M1, 36 h, Université Côte d'Azur.

Stéphane Descombes, *Principal components analysis*, M2, 30 h, Université Côte d'Azur.

Stéphane Lanteri, *High performance scientific computing*, MAM5, 24 h, Polytech Nice Sophia.

Claire Scheid, *Analyse Hibertienne et analyse de Fourier, Practical works*, Master 1 MPA, 36h, Université Côte d'Azur.

Claire Scheid, *Option Math 2*, Licence 1, 20h, Université Côte d'Azur.

Claire Scheid, *Méthodes numériques en EDP, Lectures and practical works*, Master 1 MPA and IM, 63h, Université Côte d'Azur.

Claire Scheid, *Option Modélisation, Lectures and practical works*, Master 2 Agrégation, 48h, Université Côte d'Azur.

Claire Scheid, *Analyse, Lecture and practical works*, Master 2 Agrégation, 27h, Université Côte d'Azur.

Claire Scheid, *EDP et Différences Finies, Lectures and practical works*, Master 1 MPA and IM, 72h, Université Côte d'Azur.

9.2.2. Supervision

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

PhD in progress: Georges Nehmetallah, *Efficient finite element type solvers for the numerical modeling of light transmission in nanostructured waveguides and cavities*, November 2017, Stéphane Descombes and Stéphane Lanteri.

PhD defened in September 2018: Nikolai Schmitt, *High-order simulation and calibration strategies for spatially dispersive metals in nanophotonics*, Stéphane Lanteri and Claire Scheid.

NANO-D Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Reviewer

- Léonard Jaillet has been reviewer for the IROS 2018 conference (International Conference on Intelligent Robots and Systems).
- Sergei Grudinin was a reviewer for the BIBM'18 conference (The IEEE International Conference on Bioinformatics and Biomedicine), and 6th International Work-Conference on Bioinformatics and Biomedical Engineering (IWBBIO 2018).

8.1.2. Journal

8.1.2.1. Reviewer - Reviewing Activities

Sergei Grudinin has reviewed submissions for the following journals : PLOS Computational Biology, Journal of Computer–Aided Molecular Design, Bioinformatics, Computational Biology and Chemistry, Journal of Computational Chemistry, Proteins, Nature, BMC Bioinformatics, The Journal of Physical Chemistry, IEEE Access, Accounts of Chemical Research, Computational and Structural Biotechnology Journal.

8.1.3. Invited Talks

- Sergei Grudinin gave an invited talk 'Algorithms for Protein–Protein Docking' at the Meet–U 2018 course on structural bioinformatics, Paris, 2018.
- Sergei Grudinin gave an invited talk 'Using Machine Learning for Structure–Based Predictions of Protein–Ligand Interactions' at the 7th French–Japanese Workshop on Computational Methods in Chemistry, Strasburg, 2018.
- Sergei Grudinin gave an invited talk 'Novel Methods for Structural Bioinformatics' at the GDR BIM / GT Méthodes Algorithmiques pour les Structures et Interactions, Paris 2018.
- Sergei Grudinin gave an invited talk 'Using machine learning to predict protein structure and interactions' at the VIth International Conference "Chemistry, Structure and Function of Biomolecules", Minsk, 2018.
- Sergei Grudinin gave an invited talk 'Predicting protein interactions with protein flexibility and small-angle scattering profiles' at the Modeling of Protein Interactions (MPI) 2018 conference, November 8-10, Lawrence, KS, USA.
- Sergei Grudinin gave an invited talk on data-assisted modeling of protein structures at the CASP13 conference, Iberostar Paraiso, Riviera Maya, Mexico December 1-4, 2018.
- Sergei Grudinin gave an invited talk 'Artificial Intelligence for Learning Protein Interactions' at the 4th International Conference on Mathematical and Computational Medicine, December 3-7, 2018, Cancun, Mexico.

8.1.4. Leadership within the Scientific Community

Sergei Grudinin with his colleagues from ILL has organized a new data-assisted (SANS) sub-challenge for the CASP13 community-wise protein structure prediction exercise.

8.1.5. Scientific Expertise

Sergei Grudinin reviewed an application for the OPUS funding scheme at the National Science Center, Poland.

8.2. Teaching - Supervision - Juries

8.2.1. Supervision

PhD : Phd thesis defence of Minh Khoa Nguyen, Université Grenoble Alpes, 2018
Title: Efficient exploration of molecular paths from As-Rigid-As-Possible approaches and motion planning methods [67].
Thesis committee: Emmanuel Mazer, Léonard Jaillet, Stéphane Redon, Juan Cortes, Charles Robert, Dirk Stratmann.
Summary: In this dissertation, we are particularly interested in developing new methods to find for a system made of a single protein or a protein and a ligand, the pathways that allow a transition from one state to another. During a few past decades, a vast amount of computational methods has been proposed to address this problem. However, these methods still have to face two challenges: the high dimensionality of the representation space, associated to the large number of atoms in these systems, and the complexity of the interactions between these atoms. This dissertation proposes two novel methods to efficiently find relevant pathways for such biomolecular systems. The methods are fast and their solutions can be used, analyzed or improved with more specialized methods. The first proposed method generates interpolation pathways for biomolecular systems using the As-Rigid-As-Possible (ARAP) principle from computer graphics. The method is robust and the generated solutions best preserve the local rigidity of the original system. An energy-based extension of the method is also proposed, which significantly improves the solution paths. However, in the scenarios requiring complex deformations, this approach may still generate unnatural paths. Therefore, we propose a second method called ART-RRT, which combines the ARAP principle for reducing the dimensionality, with the Rapidly-exploring Random Trees from robotics for efficiently exploring possible pathways. This method not only gives a variety of pathways in reasonable time but the pathways are also low-energy and clash-free, with the local rigidity preserved as much as possible. The mono-directional and bi-directional versions of the ART-RRT method were applied for finding ligand-unbinding and protein conformational transition pathways, respectively. The results were found to be in good agreement with experimental data and other state-of-the-art solutions.

PhD : Phd thesis defence of Alexandre Hoffmann, Université Grenoble Alpes, 2018
Title: Docking Flexible Proteins using Polynomial Expansions.
Thesis committee: Valérie Perrier, Slavica Jonic, Florence Tama, Sergei Grudinin, Marc Delarue, Roland Hildebrand.
Summary: This thesis focuses on two main axes. The first axis is the development of a new method that exhaustively samples both rigid-body and collective motions computed via normal mode analysis (NMA). We first present a method that combines the advantages of the fast Fourier transform (FFT)-based exhaustive search, which samples all the conformations of a system under study on a grid, with a local optimization technique that guarantees to find the nearest optimal off-grid and flexible conformation. The algorithm first samples a quadratic approximation of a scoring function on a 6D grid. Then, the method performs the flexible search by maximizing the quadratic approximation of the cost function within a certain search space. We then present a multi-step version of our algorithm, which finds the collective motions that maximize the docking score with respect to the rigid-body degrees of freedom (DOFs). The method exhaustively samples both rigid- body and collective motions by maximizing the soft maximum over the rigid body DOFs of the docking/fitting cost function. Both methods were applied to docking problems on both real and artificial example and we were able to design a benchmark in which the "fit then refine" approach fails at finding the correct conformation while our method succeeds.

The second axis is the development of a new extrapolation of motions computed by NMA. We show that it is possible, with minimal computations, to extrapolate the instantaneous motions computed by NMA in the rotations-translations of blocks (RTB) subspace as an almost pure rotation around a certain axis. We applied this non-linear block (NOLB) method on various biological systems and

were able to, firstly, retrieve biologically relevant motions and secondly, to demonstrate that the NOLB method generates structures with a better topology than a linear NMA method.

PhD : Phd thesis defence of Semeho Prince A. Edorh, Université Grenoble Alpes, 2018
Title: Incremental Algorithm for long range interactions [11].
Thesis committee: Stephane Redon, Olivier Coulaud, Matthias Bolten, Jean-Louis Barrat, Stefano Mossa, Jerôme Mathe.
Summary: Particle simulations have become an essential tool in various fields such as physics, astrophysics, biology, chemistry, climatology, and engineering, to name few. Usually, these computer simulations produce a temporal evolution of the system of interest by describing the motion of particles. In order to perform reliable simulations, we must provide an accurate description of interaction forces undergone by each particle. In most cases, these forces mirror inter-particle interactions and depend on relative coordinates of the particles. Moreover, pairwise long-range interactions are generally the cornerstone of particle simulations, an example being gravitational forces that are so essential in astrophysics. In molecular simulations, electrostatic forces are the most common illustration of long-range interactions. Furthermore, due to their computational cost, pairwise long-range interactions are the bottleneck of particle simulations. Therefore, sophisticated algorithms must be used for efficient evaluations of these interactions. In this thesis, we thus propose algorithms which may reduce the cost of long-range interactions when the studied system is governed by a particular dynamics. Precisely, these so-called «incremental» algorithms are effective for simulations where a part of the system remains frozen awhile. In particular, our algorithms will be validated on systems whose particles are governed by the so-called Adaptively Restrained Molecular Dynamics (ARMD) which is a promising approach in molecular dynamics simulations. Although several incremental algorithms introduced by this thesis will be devoted to molecular dynamics simulations, we believe that they can be generalized to all kinds of long-range interactions.

PhD in progress : Maria Kadukova, "Novel computational approaches for protein ligand interactions", Sep 2016-, supervisors: Sergei Grudinin (France) and Vladimir Chupin (MIPT, Russia).

PhD in progress : Guillaume Pagès, "Novel computational developments for protein structure prediction", Apr 2016-, supervisors: Sergei Grudinin (Inria), Valentin Gordeliy (IBS).

8.3. Popularization

8.3.1. Articles and contents

Sergei Grudinin and Guillaume Pagès were interviewed by Le Figaro about the progress of deep learning and artificial intelligence in protein structure prediction [88].

RAPSODI Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organization

10.1.1.1. General Chair, Scientific Chair

Four scientific events were organized by RAPSODI members in the framework of the LabEx CEMPI thematic semester on Numerical Analysis and PDEs:

- the Mathematics-Enterprises Study Week, co-organized at LILLIAD Learning Center by E. Creusé from January 29 to February 2;
- the third edition of the ABPDE conference (on Asymptotic Behavior of systems of PDEs arising in physics and biology), co-organized at LILLIAD Learning Center by C. Cancès, C. Chainais-Hillairet, I. Lacroix-Violet, and T. Rey on August 28-31;
- the second edition of the One-day conference on Calculus of Variations, co-organized at Laboratoire Paul Painlevé by I. Lacroix-Violet and B. Merlet on October 12;
- the fifth edition of the Lille days on Numerical Analysis (dedicated to domain decomposition and its applications to PDEs), co-organized at Laboratoire Paul Painlevé by C. Calgaro Zotto and E. Creusé on November 13-14.

C. Cancès co-organized a research school on Mathematics for Nuclear Energy at the Roscoff Marine Station on July 2-6, in partnership with the GdR MaNu. C. Chainais-Hillairet was part of the scientific board for this event.

In the CANUM (national NUMerical Analysis Congress) at Cap d'Agde from May 28 to June 1, three mini-symposia were organized by members of the team: one by C. Cancès on cross-diffusion systems, one by S. Lemaire on polytopal discretization methods, and one co-organized by T. Rey on kinetic models.

E. Creusé co-organized the Maths Jobs Forum that was held in Paris on December 13.

A. Zurek co-organized the Young Mathematicians Regional Tournament that was held in Laboratoire Paul Painlevé on April 14-15.

10.1.1.2. Member of the Organizing Committees

The whole team RAPSODI was involved in the organization of the ABPDE III conference.

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 and of the International Journal on Finite Volumes.

10.1.2.2. Reviewer - Reviewing Activities

RAPSODI team members are regular reviewers for all the main international journals in numerical analysis and PDEs.

10.1.3. Invited Talks

C. Cancès was an invited speaker in the International workshop on PDEs, optimal transport, and applications, held on October 17-20 in Essaouira. He was also one of the speakers in the mini-symposium on polytopal discretization methods organized by S. Lemaire at CANUM (Cap d'Agde, May 28-June 1). He finally gave several seminars in Amiens, Orsay, Strasbourg, and Munich.

C. Chainais-Hillairet was invited to give a talk in a mini-symposium on finite volume methods at the fifteenth edition of the International Conference Zaragoza-Pau on Mathematics and its Applications held in Jaca on September 10-12. She also gave a seminar in Lyon (ICJ).

B. Gaudeul presented a poster at the AMaSiS (Applied Mathematics and Simulation for Semiconductors) conference held in Berlin on October 8-10.

M. Herda gave a talk in the same conference in Berlin, and another one for the Day of the Nord-Pas-de-Calais Mathematics Research Federation on October 3 in Lille. He was also one of the speakers in the mini-symposium on kinetic models co-organized by T. Rey at CANUM (Cap d'Agde, May 28-June 1).

I. Lacroix-Violet gave several seminars in Marseille (I2M), Dijon (IMB), Montpellier (IMAG), and Rennes.

S. Lemaire was invited to give a talk in a mini-symposium on polytopal discretization methods in the biennial Congress of the Italian Society of Applied and Industrial Mathematics (SIMAI) held in Rome on July 2-6. He also gave two seminars in Montpellier (IMAG), and Inria Paris, and gave a talk for the ANEDP team day at the Laboratoire Paul Painlevé.

D. Maltese gave a talk at CANUM (Cap d'Agde, May 28-June 1).

B. Merlet was an invited speaker in the congress Geometric Measure Theory in Verona held on June 11-15, and in the Workshop in Calculus of Variations organized at Paris-Diderot on June 25-27.

T. Rey was an invited speaker for the MAFRAN Days (Mathematical Frontiers in the Analysis of Many-particle Systems) held in Cambridge on September 24-26, and in the mini-workshop Innovative Trends in the Numerical Analysis and Simulation of Kinetic Equations organized in Oberwolfach on December 16-22. He also gave several seminars in Montpellier (IMAG), Paris-Dauphine (CEREMADE), Imperial College London, and Paris-Descartes.

A. Zurek was invited to give a talk in a special session on the mathematical problems arising from materials and biological science in the twelfth edition of the AIMS Conference on Dynamical Systems, Differential Equations, and Applications held in Taipei on July 5-9. He also presented a poster at CANUM (Cap d'Agde, May 28-June 1).

10.1.4. Research Administration

C. Cancès is the head of the MaNu research group (GdR MaNu) funded by the Institute for Mathematical Sciences and its Interactions (INSMI) of the French National Center for Research (CNRS).

E. Creusé has in charge to develop some actions promoted by AMIES (Agency for the Mathematics in Interaction with the Enterprise and the Society). More particularly, his action in 2018 was devoted to several characteristic points: management of some PEPS (First Support for Exploratory Projects), discussions to initiate collaborations between academic researchers in mathematics and industrial partners, participation to the monthly AMIES meeting, organization of the Mathematics-Enterprises Study Week in Lille in January as well as of the Maths Jobs Forum in Paris in December.

I. Lacroix-Violet, B. Merlet, and T. Rey are elected members of the Conseil du Laboratoire Paul Painlevé. I. Lacroix-Violet is also a member of the Jury de domaine.

T. Rey is in charge of the organization of the weekly seminar of the ANEDP team of the Laboratoire Paul Painlevé. He is also a member of the team of the Opération Postes.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

RAPSODI team members are strongly involved in teaching at the Université de Lille. C. Calgaro Zotto is in charge of the Master of Mathematical Engineering. B. Merlet is in charge of the Master 2 of Scientific Computing. E. Creusé was responsible of the "Cursus Master en Ingénierie Mathématiques" until August. He is since September director of the Mathematics Department of the Université Polytechnique Hauts-de-France. C. Cancès gave lectures at Centrale Lille. S. Lemaire gave lectures in the Master 2 of Scientific Computing.

C. Chainais-Hillairet gave 16h of courses in the international Summer School "The way to become a mathematician" in the Harbin Institute of Technology in July.

10.2.2. Supervision

Post-doc: F. Chave arrived in December to work on high-order polytopal discretization methods for electromagnetism; supervisors: E. Creusé and S. Lemaire.

PhD: L. Ferrari defended his PhD thesis on "Phase field approximations for branched transport problems" on October 5; advisors: A. Chambolle (CNRS & CMAP, École Polytechnique) and B. Merlet.

PhD: N. Peton defended his PhD thesis on "Numerical methods for a stratigraphic model with nonlinear diffusion and moving frontier areas" on October 12; advisors: C. Cancès, Q.-H. Tran (IFPEn), and S. Wolf (IFPEn).

PhD in progress: C. Colin-Lecerf, on the "Analyse numérique et simulations de modèles multi-fluides", since 10/01/2015; advisors: C. Calgaro Zotto and E. Creusé.

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

PhD in progress: B. Gaudeul, on the "Numerical approximation of cross-diffusion systems arising in physics and biology", since 09/01/2018; advisors: C. Cancès and C. Chainais-Hillairet.

Master internship: A. El Keurti, on the "Study of upwind finite volume schemes for nonlocal transport", from November 2017 to July 2018; advisor: T. Rey.

Master internship: A. Latrech, on the "Numerical study of local minimizers of a Bose–Einstein energy functional in 2D", from January to July; advisors: G. Dujardin (Inria Lille) and I. Lacroix-Violet.

Master internship: T. Ebrahimipourfaez, on "Entropy-diminishing finite volume schemes for cross-diffusion systems", from April to July; advisor: C. Chainais-Hillairet.

Master internship: B. Gaudeul, on "Numerical schemes for a Nernst–Planck–Poisson model", from April to July; advisor: C. Chainais-Hillairet.

Master internship: C. Marinel, on the "Implementation and parallelization of a finite element code with *a posteriori* error estimators", from June to August; advisor: E. Creusé.

Master internship in progress: N. Aghouzzaf, on the "Design of high-order numerical time integrators for kinetic equations", since December; advisor: T. Rey.

10.2.3. Juries

E. Creusé reported on O. Gorynina's PhD thesis, defended on February 22, 2018 at Université Bourgogne-Franche Comté. Title: Éléments finis adaptatifs pour l'équation des ondes instationnaire.

B. Merlet was a member of the jury of the PhD thesis of A. Julia, defended on October 9, 2018 at Sorbonne Paris Cité. Title: Functions with bounded variations on a current.

C. Calgaro Zotto and C. Cancès are members of the Jury de l'Agrégation de Mathématiques, which is a national hiring committee for the highest level of high-school teachers.

C. Cancès was part of the selection committee for an associate professor (MCF) position at the Laboratoire de Mathématiques d'Orsay.

C. Chainais-Hillairet was part of the selection committee for a full professor (PR) position at Aix-Marseille Université.

10.3. Popularization

C. Calgaro Zotto is in charge of the communication of the Laboratoire Paul Painlevé. She organizes various events which promote mathematics among young people:

- les "Mathématiques itinérantes";

- la “Semaine des mathématiques”;
- la collection “Stages scientifiques en Seconde”.

Members of the team participate regularly to these actions.

S. Lemaire gave a talk at Inria Lille for the internal scientific popularization event “30 minutes of Science” in June.

CAGE Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. Member of the Organizing Committees

Ugo Boscain and Mario Sigalotti were Members of the Organizing Committee of the Workshop “Sub-Riemannian Geometry and Topolò(gy)", Topolò/Topolove, Italy, June 2018

9.1.2. Scientific Events Selection

9.1.2.1. Member of the Conference Program Committees

- Emmanuel Trélat was Member of the Program Committee of the 18th French-German-Italian Conference on Optimization (FGI’2018).
- Emmanuel Trélat was Member of the Scientific Committee of the 23rd International Symposium on Mathematical Programming (ISMP 2018).

9.1.3. Journal

9.1.3.1. 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
- Jean-Michel Coron is Editor-in-chief of Comptes Rendus Mathématique
- Jean-Michel Coron is Member of the editorial board of Journal of Evolution Equations
- Jean-Michel Coron is Member of the editorial board of Asymptotic Analysis
- Jean-Michel Coron is Member of the editorial board of ESAIM : Control, Optimisation and Calculus of Variations
- Jean-Michel Coron is Member of the editorial board of Applied Mathematics Research Express
- Jean-Michel Coron is Member of the editorial board of Advances in Differential Equations
- Jean-Michel Coron is Member of the editorial board of Math. Control Signals Systems
- Jean-Michel Coron is Member of the editorial board of Annales de l’IHP, Analyse non linéaire
- Mario Sigalotti is Associate editor of ESAIM : Control, Optimisation and Calculus of Variations
- Mario Sigalotti is Associate editor of Journal on Dynamical and Control Systems
- Emmanuel Trélat is Editor-in-chief of ESAIM : Control, Optimisation and Calculus of Variations
- Emmanuel Trélat is Associate editor of Syst. Cont. Letters
- Emmanuel Trélat is Associate editor of J. Dynam. Cont. Syst.
- Emmanuel Trélat is Associate editor of Bollettino dell’Unione Matematica Italiana
- Emmanuel Trélat is Associate editor of ESAIM Math. Modelling Num. Analysis
- Emmanuel Trélat is Editor of BCAM Springer Briefs
- Emmanuel Trélat is Associate editor of J. Optim. Theory Appl.
- Emmanuel Trélat is Associate editor of Math. Control Related fields

9.1.4. Invited Talks

- Ugo Boscain was invited speaker at the International Conference “Optimal Control and Differential Games”, dedicated to the 110th anniversary of L.S. Pontryagin, Dec. 2018.
- Ugo Boscain was invited speaker at the conference “Dynamics, Control, and Geometry", Banach Center, Warsaw, Sept. 2018.
- Ugo Boscain was invited speaker at Linkopyng University, Department of Electrical Engineering, Nov. 2018.
- Ugo Boscain was invited speaker at the conference “Analysis, Control and Inverse Problems for PDEs”, Napoli (Italy), Nov. 2018.
- Mario Sigalotti was invited speaker at the Workshop Quantum control and feedback: foundations and applications, Paris, Jun. 2018.
- Emmanuel Trélat was invited speaker at ICM 2018, Rio, section “Control Theory and Optimization", Aug. 2018.
- Emmanuel Trélat was invited speaker at Analysis, Control and Inverse Problems for PDEs, Naples, Nov. 2018.
- Emmanuel Trélat was invited speaker at Dynamics Control and Geometry, Varsovie, Sept. 2018.
- Emmanuel Trélat was invited speaker at 14th Viennese Conference on Optimal Control and Dynamic Games, Vienna, July 2018.
- Emmanuel Trélat was invited speaker at Portuguese Meeting on Optimal Control 2018, Coimbra (Portugal), June 2018.
- Emmanuel Trélat was invited speaker at International Symposium on Mathematical Control Theory, Shanghai, June 2018.
- Emmanuel Trélat was invited speaker at GAMM Munich, March 2018.

9.1.5. Leadership within the Scientific Community

Emmanuel Trélat is director of the Fondation Sciences Mathématiques de Paris (FSMP).

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

- Ugo Boscain thought “Sub-elliptic diffusion” to PhD students at SISSA, Trieste Italy
- Ugo Boscain thought “Automatic Control” (with Mazyar Mirrahimi) at Ecole Polytechnique
- Ugo Boscain thought “MODAL of applied mathematics. Contrôle de modèles dynamiques” at Ecole Polytechnique
- Emmanuel Trélat thought “Control in finite and infinite dimension” at Master 2, Sorbonne Université

9.2.2. Supervision

PhD: Riccardo Bonalli, Optimal Control of Aerospace Systems with Control-State Constraints and Delays, Sorbonne Université, July 2018, supervised by Emmanuel Trélat.

PhD: Antoine Olivier, Optimal and robust attitude control of a launcher, Sorbonne Université, October 2018, supervised by Emmanuel Trélat and co-supervised by Thomas Haberkorn, Éric Bourgeois, David-Alexis Handschuh.

PhD: Ludovic Sacchelli, Singularities in sub-Riemannian geometry, Université Paris-Saclay, September 2018, supervised by Ugo Boscain and Mario Sigalotti.

PhD in progress: Nicolas Augier, “Contrôle adiabatique des systèmes quantiques", started in September 2016, supervisors: Ugo Boscain, Mario Sigalotti.

PhD in progress: Amaury Hayat, “ Contrôle et stabilisation en mécanique des fluides", started in October 2016, supervisors: Jean-Michel Coron and Sébastien Boyaval

PhD in progress: Mathieu Kohli, “Volume and curvature in sub-Riemannian geometry", started in September 2016, supervisors: Davide Barilari, Ugo Boscain.

PhD in progress: Gontran Lance, started in September 2018, supervisors: Emmanuel Trélat and Enrique Zuazua.

PhD in progress: Cyril Letrouit, “Équation des ondes sous-riemanniennes", started in September 2019, supervisor Emmanuel Trélat.

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.

PhD in progress: Eugenio Pozzoli, “Adiabatic Control of Open Quantum Systems", started in September 2018, supervisors: Ugo Boscain and Mario Sigalotti.

PhD in progress: Shengquan Xiang, Stabilisation des fluides par feedbacks non-linéaires, September 2016, supervisor: Jean-Michel Coron.

PhD in progress: Christophe Zhang, started in October 2016, supervisor: Jean-Michel Coron

9.2.3. Juries

- Ugo Boscain was referee and member of the jury of the HDR of Jean-Marie Mirebeau, Université Paris-Sud.
- Mario Sigalotti was member of the jury of the PhD thesis of Abdelkrim Bahloul, Univ. Paris-Saclay.
- Emmanuel Trélat was co-supervisor and member of the jury of the PhD thesis of Camille Pouchol, Sorbonne Université.
- Emmanuel Trélat was member of the jury of the PhD thesis of F. Omnès, Sorbonne Université.
- Emmanuel Trélat was referee and member of the jury of the PhD thesis of S. Mitra, Univ. Toulouse.
- Emmanuel Trélat was referee and member of the jury of the PhD thesis of T. Weisser, Univ. Toulouse.
- Emmanuel Trélat was referee and member of the jury of the PhD thesis of S. Maslovskaya, Univ. Paris-Saclay.
- Emmanuel Trélat was referee and member of the jury of the PhD thesis of A. Vieira, Grenoble University.
- Emmanuel Trélat was member of the jury of the HDR of F. Chittaro, Univ. Toulon.

9.3. Popularization

Emmanuel Trélat is member of the Comité d’Honneur du Salon des Jeux et Culture Mathématique since November 2018

9.3.1. Articles and contents

- Nicolas Augier, Ugo Boscain, and Mario Sigalotti are authors of the popularization article [32] explaining how broken adiabatic paths can be used to enhance the control of a quantum systems.

9.3.2. Education

- Ugo Boscain and Jean-Michel Coron gave a lecture at journée ENS-UPS, ENS Paris
- Emmanuel Trélat gave a lecture at ENS Ulm to first-year students
- Emmanuel Trélat gave a lecture at Université Paris-Diderot to first- and second-year students

9.3.3. Interventions

- Ugo Boscain gave a lecture at Alfaclass, Saint-Barthélemy, Aosta, Italy
- Emmanuel Trélat gave a lecture at Salon des Jeux et Culture Mathématique

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: PGMO Days 2018.

10.1.2. Journal

10.1.2.1. Member of the Editorial Boards

- F. Bonnans: Associate Editor of "Applied Mathematics and Optimization" and of "Series on Mathematics and its Applications, Annals of The Academy of Romanian Scientists".

10.1.3. Invited Talks

- F. Bonnans: CAESAR workshop, Palaiseau, Sept. 5-7, 2018.

10.1.4. Leadership within the Scientific Community

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

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Master :
F. Bonnans: *Numerical analysis of partial differential equations arising in finance and stochastic control*, 18h, M2, Ecole Polytechnique and U. Paris 6, France.
F. Bonnans: *Optimal control*, 15h, M2, Optimization master (U. Paris-Saclay) and Ensta, France.
A. Kröner : Optimal control of partial differential equations, 20h, M2, Optimization master (U. Paris-Saclay), France.

10.2.2. Supervision

Finished PhD : C. Rommel, Data exploration for the optimization of aircraft trajectories. Started November 2015, finished Oct 2018 (CIFRE fellowship with Safety Line), F. Bonnans and P. Martinon.

PhD in progress : A. Le Rhun, Optimal and robust control of hybrid vehicles. Started September 2016 (IFPEN fellowship), F. Bonnans and P. Martinon.

PhD in progress : G. Bonnet, Efficient schemes for the Hamilton-Jacobi-Bellman equation. Started Oct. 2018. F. Bonnans and J.-M. Mirebeau, LMO, U. Orsay.

PhD in progress : P. Lavigne, Mathematical study of economic equilibria for renewable energy sources. Started Oct. 2018. F. Bonnans.

PhD in progress : E. Weill, Optimal control of partial differential equation systems: Application to heterogeneous cell populations. Started Oct. 2018. F. Bonnans and G. Batt, Inria and Institut Pasteur.

10.3. Popularization

10.3.1. Internal or external Inria responsibilities

- F. Bonnans: codirection of a joint Allistene-Ancre commission (contribution to the national strategy for research), Numerics and Energy committee (2017-2018).
- F. Bonnans: Dimitrie Pompeiu Prize Committee (Academy of Romanian Scientists).
- P. Martinon is member of the CDT.

10.3.2. Articles and contents

- The work on races on curved tracks was covered in the Sciences page of Le Figaro.

10.3.3. Internal action

- The collaboration with startup Safety Line was presented to the “Journée Nationale des Nouveaux Arrivants”

DISCO Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Scientific Events Organisation

8.1.1.1. Member of the Organizing Committees

Catherine Bonnet is member of the organizing committee of SIAM CT19, Chendu China, July 2019. Islam Boussaada is co-animator of the national working group GT OSYDI of the GDR MACS funded by CNRS. Giorgio Valmorbida was member of the Organizing committee of the 2nd Workshop on DElays and COnstraints on Distributed parameter systems (DECOD-2018).

8.1.2. Scientific Events Selection

- Catherine Bonnet was Associate Editor for the conferences 2019 American Control Conference, Philadelphia, USA.
- Islam Boussaada was Associate Editor for 14th IFAC Workshop on Time Delay Systems, Budapest, Hungary.
- Frédéric Mazenc was Associate Editor for the conferences 2019 American Control Conference, Philadelphie, USA, and the 57th IEEE Conference on Decision and Control, Miami, USA, (2018).

8.1.2.1. Member of the Conference Program Committees

- Catherine Bonnet is a member of the scientific committee of the GDRI (International Research Group funded by CNRS) SpaDisco since 2017.
- Catherine Bonnet, Islam Boussaada and Sorin Olaru are members of the International Program Committee of the Joint IFAC Conference 7th Symposium on System Structure and Control (SSSC 2019) and 15th IFAC Workshop on Delay Systems, Sinaia, Roumania, Sept 2019.
- Islam Boussaada was a member of the International Program Committee for 14th IFAC Workshop on Time Delay Systems (TDS 2018), Budapest, Hungary.
- Frédéric Mazenc and Giorgio Valmorbida are members (Associate Editors) of the *Control Editorial Board - IEEE - CSS*. Sorin Olaru was member of the International Program Committee of the 9th IFAC Symposium on Robust Control Design - ROCOND and of the IEEE Mediterranean Control Conference.

8.1.2.2. Reviewer

The team reviewed papers for several international conferences including IEEE Conference on Decision and Control, IEEE American Control Conference, European Control Conference, IFAC World Congress.

8.1.3. Journal

8.1.3.1. Member of the Editorial Boards

Frédéric Mazenc is member of the editorial boards (Associate Editor) of the following journals:

- IEEE Transactions on Automatic Control;
- European Journal of Control;
- Journal of Control and Decision.

Sorin Olaru is is member of the editorial boards (Associate Editor) of the following journals:

- IEEE Control Systems Letters;
- IMA Journal of Mathematical Control and Information, Oxford Press.

8.1.3.2. Reviewer - Reviewing Activities

The team reviewed papers for several journals including SIAM Journal on Control and Optimization, Automatica, IEEE Transactions on Automatic Control, IEEE Control Systems Magazine, Systems and Control Letters.

8.1.4. Invited Talks

Stefanella Boatto gave a talk at the biomathematics Seminar of Institut de Mathématiques de Marseille, Aix-Marseille univerité, February 2018, Marseilles, France. Title of her talk: '*Modelling epidemics dynamics due to Aedes mosquitoes : the example of Rio de Janeiro. How to approximate an epidemic attractor and to estimate the infectivity rate*'.

Frédéric Mazenc was a plenary speaker of the conference POSTA2018, August 2018, Hangzhou, China. Title of his talk: '*Stability of Positive Systems With Delay: Changes of Coordinates, Comparison Systems, Lyapunov Functionals*'.

Giorgio Valmorbida gave an invited talk at the International Workshop on Robust LPV Control Techniques and Anti-Windup Design, April 2018, Toulouse, France. Title of his talk: '*Anti-Windup Design for Synchronous Machines*'.

Giorgio Valmorbida gave an invited talk at the Meeting of the GT CSE (groupe de travail Commande de Systèmes Éléctriques) , May 2018, Paris, France. Title of his talk: '*Anti-Windup Design for Synchronous Machines*'.

Giorgio Valmorbida gave an invited talk at the 2nd Workshop on Stability and Control of Infinite-Dimensional Systems (SCINDIS-2018), May 2018, Wurzburg, Germany. Title of his talk: '*Convex Optimization Methods to Solve Integral Inequalities*'.

Giorgio Valmorbida gave an invited talk at the 2nd Workshop on DElays and COnstraints on Distributed parameter systems (DECOD-2018), November 2018, Toulouse, France. Title of his talk: '*Stability Analysis of Piece-wise Affine Discrete-Time systems*'.

8.1.5. Leadership within the Scientific Community

Catherine Bonnet is a member of the IFAC Technical Committees on *Distributed Parameter Systems* and on *Biological and Medical Systems*. She is a member of the management committee of the COST Action FRACTAL (2016-2020). Sorin Olaru is a member of the IFAC Technical Committees on *Robust Control* and on *Optimal control*. He is a member of the IEEE Technical Committee on *Hybrid Systems*. He is a Senior Member IEEE since 2012.

8.1.6. Scientific Expertise

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

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 an 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 an 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 member of the administration council of the association *Femmes et Mathématiques*, of the *Parity Committee* of Inria and of the *Cellule veille et prospective* of Inria (both created in 2015). She is a member of the Bureau du Comité des Projets du CRI Saclay-Ile-de-France.

In 2018, Frédéric Mazenc is a member of the commission scientifique du CRI Saclay-Ile-de-France. Since October 2017, he is Correspondant Inria Saclay A.M.I.E.S., http://www.agence-maths-entreprises.fr/

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

Master : Stefanella Boatto, Challenges in Biomathematical Modelling, 3h, M1, CentraleSupélec, France.

Master : Catherine Bonnet, Stability of Delay Systems, 1.5h, M1, CentraleSupélec.

Licence : Islam Boussaada, Complex analysis, 60, L3, IPSA, France.

Licence : Islam Boussaada, Harmonic analysis, 60, L3, IPSA.

Licence : Sorin Olaru, Automatic Control, 8h , M1, CentraleSupélec.

Licence : Sorin Olaru, Signals and systems, 8h , L3, CentraleSupélec.

Licence : Sorin Olaru, Embedded systems, 8h , M1, CentraleSupélec.

Licence : Sorin Olaru, Numerical methods and Optimization, 24h, M1, CentraleSupélec.

Licence : Sorin Olaru, Hybrid systems, 16h, M2, CentraleSupélec.

Licence : Guillaume Sandou, Signals and Systems, 87h, L3, CentraleSupélec.

Licence : Guillaume Sandou, Model representation and analysis, 70h, L3, CentraleSupélec.

Licence : Guillaume Sandou, Mathematics and programming, 18h, L3, CentraleSupélec.

Licence : Giorgio Valmorbida, Embedded systems, 7.5h, M1, Cursus Ingénieur CentraleSupélec.

Master : Guillaume Sandou, Automatic Control, 8h, M1, CentraleSupélec.

Master : Guillaume Sandou, Numerical methods and optimization, 28h, M1 and M2, CentraleSupélec.

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.

Master : Giorgio Valmorbida, Numerical methods and optimisation, 6 h, 6hETD, niveau M1, Cursus Ingénieur CentraleSupélec.

Master : Giorgio Valmorbida, Commande d'Entraînements de Vitesse Variable 12 h, M1, Cursus Ingénieur CentraleSupélec.

Master : Giorgio Valmorbida, Control Theory, 7.5 h, M1, Cursus Ingénieur CentraleSupélec.

Master : Giorgio Valmorbida, Dynamical Systems, 9 h, M2, Master Automatique Taitement du Signal et de I'image - Université Paris-Saclay, France.

Master : Giorgio Valmorbida, Control 30h, niveau M1, Master Nuclear Energy - Université Paris-Saclay.

Doctorat : Islam Boussaada, Introduction to the qualitative theory of functional differential equations, 12h, University Mouloud Mammeri, Algeria

8.2.2. Supervision

PhD : Saeed Ahmed, title: *Observer Design and Output Feedback Stabilization of Time Varying Systems*, Bilkent University. Thesis defense: 03 July 2018, supervisors: Hitay Ozbay, 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. Modeling and multi-scale advanced management of production, distribution and demand in district heating networks. Supervisor: Guillaume Sandou.

PhD in progress : Leonardo Broering Groff, Periodic Event-Triggered Control, mars 2016. Supervisors: Giorgio Valmorbida and Joao Manoel Gomes da Silva Jr.

PhD in progress : Caetano Cardeliquio, Stability and stabilization of (possibly fractional) systems with delays. French Supervisor : Catherine Bonnet, Brazilian Supervisor : André Fioravanti.

PhD in progress : Mohamed Lotfi Derouiche, Sur l'optimisation par métaheuristiques avancées de lois de commande prédictive non linéaire. On the optimization of nonlinear predictive control laws using advanced metaheuristics algorithms. Supervisors: Soufienne Bouallegue, Joseph Haggége et Guillaume Sandou.

PhD : Nicolo Gionfra, Optimisation du pilotage d'un parc d'énergies renouvelables avec stockage et du réseau de distribution sous-jacent. Optimization of the control of a park of renewable sources considering strorage means and distribution network. Supervisors: Houria Siguerdidjane et Guillaume Sandou. Defended in March 2018.

PhD in progress : Jean Mercat, Modele predictif des objets d'une scene routiere ; application à la sélection robuste des cibles pour les ADAS. Supervisor: Guillaume Sandou.

PhD in progress : Maxime Pouilly-Cathelain, Commande adaptative temps réel vis-a-vis de critères multiples de haut niveau. Supervisor : Guillaume Sandou.

8.2.3. Juries

- Catherine Bonnet was President of the Saclay-Ile-de-France Junior Researcher recruiting committee and a member of the National Inria Junior Researcher recruiting committee.
- Catherine Bonnet was reviewer of the PhD thesis of Mohamad Taki Asghar *'New advanced control strategies for steel making process'*, 3 May 2018, Université de Nancy. She was President of the PhD Defense juries of Noussaiba Gasmi *'Observation et commande des systèmes dynamiques d'ordre non entier'*, 14 November 2018, Université de Nancy, of Pierre-Marie Gibert *'Use of sinusoidal predictors for time-domain simulation of AC power systems'*, 30 November 2018, Université de Lyon, of Abdelkrim Bahloul *'Sur la commande des robots manipulateurs industriels en co-manipulation robotique'*, 7 December 2018, L2S, CentraleSupelec, and member of the PhD Defense jury of Bainan Liu *'Boundary obeserver-based output feedback control of coupled parabolic PDEs'*, 17 December 2018, INSA centre Val de Loire.
- Frédéric Mazenc was a reviewer of the Phd thesis of Ricardo Sanz Diaz, '*Robust control strategies for unstable systems with input/output delays*', September 27, 2018, Universitat Politecnica de Valencia, Spain and of the Phd thesis of Mohammed Safi, '*Stabilité de Lyapunov de systèmes couplés impliquant une équation de transport*', October 31, 2018, LAAS, Université de Toulouse, France.
- Sorin Olaru was President of the PhD Defense jury of Dominique Monnet, '*Global Minmax optimization for robust Hinf control*', université de Brest, France, reviewer of the PhD Defense jury of Nadia Paola Rosero Ibarra,*'Modeling and Observation applied to physiology-aware control for cycling'*, 12 November 2018, université Grenoble Alpes, France and member of the PhD Defense jury of Nassim Loukkas, *'State-membership state observer design based on explicit characterizations of the estimation-error bounds'*, 6 June 2018, université Grenoble Alpes.
- Giorgio Valmorbida was a member of the jury of the Phd thesis of Fabien Niel, *'Modeling and control of a wing at low Reynolds number with high amplitude aeroelastic oscillations'*, 26 January 2018, LAAS, université de Toulouse, France.

8.3. Popularization

8.3.1. Interventions

Catherine Bonnet awarded the price of Mathematics and Italian et Italien at the *Concours Général des lycées et des métiers du Ministère de l'Éducation nationale*, Grand Amphitéatre de La Sorbonne, July 2018. She welcomed a group of middle school students, 17 December 2018.

FACTAS Team

9. Dissemination

9.1. Promoting Scientific Activities

- V. L. Coli presented oral communications at the "Journées Idex UCA[JEDI] Matière, Lumière, Interactions", October 4-5, Fréjus, France, http://univ-cotedazur.fr/events/MLI/fr, and at the Journée d'échanges "Applications de la tomographie par rayons X", November 23, Paris, France, https://jea-tomo3d-2018.sciencesconf.org/.
- J. Leblond and K. Mavreas presented oral communications at the 5th International Conference "Modern Mathematical Methods in Science and Technology 2018 (M3ST '18)", September 2-4, Kalamata, Greece.
- K. Mavreas gave a talk at the PhD Seminar at Inria Sophia, France, November 13, https://phd-seminars-sam.inria.fr.
- G. Bose, S. Fueyo and D. Martinez Martinez presented posters at the Workshop ERNSI 2018, http://mlg.eng.cam.ac.uk/ernsi2018/.
- G. Bose gave a talk at the 23rd International Symposium on Mathematical Theory of Networks and Systems http://mtns2018.ust.hk/, July 16-20 2018, Hong-Kong.
- D. Martinez Martinez gave a talk at the 7th International Workshop on Microwave Filters https://artes.esa.int/news/7th-international-workshop-microwave-filters, 17-19 Apr 2018, Noordwijk, Netherlands, and a talk at the 2nd URSI AT-RASC (Atlantic Radio Science) http://www.ursi.org/events.php?atrasc=on, May 28 - June 1, 2018, Gran Canaria, Spain, and a talk at IMS 2018 https://ims2018.org/, June 10-15 2018., Philadelphia, USA
- A. Cooman gave a talk at IMS 2018 https://ims2018.org/, June 10-15, 2018, Philadelphia, USA.
- F. Seyfert gave a talk at IMS 2018 https://ims2018.org/, June 10-15 2018, Philadelphia, USA and at the KTH's seminar May 15, Stockholm, Sweden and at XLIM seminar, October 3, Limoges, France

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

- L. Baratchart, S. Chevillard, and J. Leblond organized (scientifically and practically) the Spring School/Workshop "Inverse problems and approximation techniques in planetary sciences" [0], at Inria Sophia Antipolis, May 16-18. It was financially supported by UCA[Jedi] and gathered around 20 participants.

9.1.1.2. Member of the Organizing Committees

- L. Baratchart and J. Leblond organized a mini-symposium [0] on "Inverse source problems with applications to planetary sciences and medical imaging" at the 9th international conference "Inverse problems: modeling and simulation (IPMS 2018)", Malta, May 21-25.
- Fabien Seyfert organized a workshop at IMS 2018, on "Advanced Synthesis Techniques for reduced size filtering techniques", https://ims2018.org/technical-program/workshops-and-short-courses#2018-06-15, Philadelphia, USA.

[0] http://www-sop.inria.fr/apics/IPAPS18/
[0] http://www.ipms-conference.org/ipms2018/index.php/m20

9.1.2. Scientific Events Selection

9.1.2.1. Member of the Conference Program Committees

L. Baratchart sits on the Program Committee of *Applied Inverse Problems 2019*, to be held in Grenoble, France.

9.1.3. Journal

9.1.3.1. Member of the Editorial Boards

L. Baratchart sits on the editorial boards of "Constructive Methods in Function Theory" and "Complex Analysis and Operator Theory".

9.1.3.2. Reviewer - Reviewing Activities

S. Chevillard was a reviewer for the journal *Transactions on Mathematical Software*.

J. Leblond was a reviewer for the journals *Numerical Algorithms, DMV Jahresberichte*.

M. Olivi was a reviewer for the journal *Automatica* and for the *18th IFAC Symposium on System Identification* (SYSID 2018).

F. Seyfert is a reviewer of *IEEE Transactions on Microwave Theory and Techniques*.

L. Baratchart was a reviewer for the seed fund program at MIT.

9.1.4. Invited Talks

- L. Baratchart was an invited speaker at the SIGMA day organized by SMAI at Université Pierre et Marie Curie, November 30.
- L. Baratchart and J. Leblond were invited to give talks at the IPMS 2018 conference, Malta, May (see Section 9.1.1). They were invited speakers at the Conference "Advances in Operator Theory with Applications to Mathematical Physics", http://www1.chapman.edu/~alpay/conf2018/conf2018.html, Chapman University, Orange, CA, USA, November.
- L. Baratchart and K. Mavreas gave talks at the workshop "Inverse problems and approximation techniques in planetary sciences", Sophia Antipolis, France, May.

9.1.5. Scientific Expertise

L. Baratchart is sitting on committee 40 of the ANR.

J. Leblond was a reviewer for the Strategic Research Programmes of the Research Council of the Vrije Universiteit Brussel (VUB, Brussel, Belgium).

F. Seyfert is a member of the IEEE MTT-8 committee for filters and passive components.

9.1.6. Research Administration

L. Baratchart sits on the committee "Mathématiques et Informatique" of the French Agency for research (ANR).

J. Leblond is an elected member of the "Conseil Scientifique" and of the "Commission Administrative Paritaire" of Inria.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

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

9.2.2. Supervision

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, F. Seyfert, M. Olivi.

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

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

Post-doc. in progress: V. L. Coli, *Multiscale Tomography: imaging and modeling ancient materials*, since March 2018, advisors: J. Leblond, L. Blanc-Féraud (project-team Morpheme, I3S-CNRS/Inria Sophia/iBV), D. Binder (CEPAM-CNRS, Nice).

Post-doc.: A. Cooman, from January 2017 until June 2018, advisors: F. Seyfert and M. Olivi.

9.2.3. Juries

J. Leblond was a member of the "Comités de Suivi Doctoraux" (preliminary evaluation committees, after one year of PhD) for the ongoing PhDs of Kostiantyn Maksymenko (project-team Athena, doctoral school STIC, UCA), and for Arne Bechensteen (project-team Morpheme, I3S-CNRS), May. She was a member of a "Comité de Sélection" for professors at the University Paris Descartes (MAP5).

M. Olivi was a member of the "jury d'admission du concours CR" of the Inria Research Center.

9.3. Popularization

9.3.1. Internal or external Inria responsibilities

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/. Her main contributions related with this mission were:

- submit applications to get founding for 2019: "cordées de la réussite" (accepted) et "APOCS région".
- co-organize 10 robotic sessions for 2 classes of middle school students (device "MEDITES" http://medites.fr, founded by ANRU, the "Agence Nationale de Rénovation Urbaine"),
- co-organize the "stage MathC2+" https://project.inria.fr/mastic/mediation/stage-mathc2/, a four-day internship for 50 high school students ("secondes", about 16 years old) organized by the Committee MASTIC and its partners (June 19-22),
- co-organize Inria participation to the event "Le Village des Sciences et de l'Innovation" in Antibes (October 20-21, 10000 people), and the event "Mouans-Sartoux fête les sciences du quotidien" http://univ-cotedazur.fr/events/fetedelascience.
- co-organize about 10 "cafés scientifiques" (c@fé-in's and cafés Techno, 30 to 80 participants each) https://project.inria.fr/mastic/category/cafein/.

9.3.2. Education

- M. Olivi animated a half-day workshop session "activités débranchées" at "l'ESPE de Nice" for primary school students (April 10).

9.3.3. Interventions

- National events: M. Olivi participated to the event "Le Village des Sciences et de l'Innovation" in Antibes (October 20-21, 8000 people) and to the event "Mouans-Sartoux fête les sciences du quotidien" (October 13, 1000 people).
- In educational institutions: M. Olivi participated to the event "bilan Medium's" at the "collège Émile Roux, Le Cannet".

- Welcoming of schoolchildren or the general public in an Inria center: M. Olivi animated a workshop session during the “stage MathC2+”, a four-day internship for high-school students organized by the Committee MASTIC and its partners (June 19-22).

9.3.4. Internal action

- M. Olivi presented the scientific objects produced during the year at the CaféIn of the Research Center, https://project.inria.fr/mastic/cafe-in-12-fevrier-manipulons-et-echangeons/, February.
- J. Leblond together with members of the SED gave a communication at the CaféIn of the Research Center, http://project.inria.fr/mastic/category/cafein/, October.

9.3.5. Creation of media or tools for science outreach

M. Olivi participated in the creation of the web pages https://pixees.fr/jouons-avec-des-experiences-scientifiques/.

I4S Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Scientific Events Organisation

8.1.1.1. 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 co-chair of a session at EGU 2018 (http://www.egu2018.eu/).

Q. Zhang is

- member of the international program commitee of the 18th IFAC Symposium SYSID that will take place in Stockholm, Sweden, July 9-11, 2018.
- member of the international program commitee of the 10th IFAC Symposium SAFEPROCESS that will take place in Warsaw, Poland, 29-31 August 2018.
- 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.
- member of IFAC Technical Committee on Adaptive and Learning Systems.

L. Mevel is

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

V. Le Cam is

- member of the IWSHM scientific committee.
- head and general secretary of the EWSHM scientific committee.
- session chairman for EWSHM 2018 in Manchester, UK.

M. Doehler is

- member of IFAC Technical Committee on Modelling, Identification, and Signal Processing.
- member of the IOMAC scientific committee.

8.1.1.2. Reviewer

Q. Zhang was reviewer for CDC 2018, ACC 2019.

M. Doehler was reviewer for SYSID 2018, SAFEPROCESS 2018 and ACC 2019.

J. Dumoulin was reviewer for EGU2018, QIRT2018 and SFT 2018

L. Mevel was reviewer for SAFEPROCESS 2018 and SYSID 2018

8.1.2. Journal

8.1.2.1. Member of the Editorial Boards

L. Mevel is member of the editorial board of the journal Mathematical Problems in Engineering, and of the journal 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 Quantitative Infrared Thermography, and of the journal Geoscientific Instrumentation and Data Systems.

8.1.2.2. Reviewer - Reviewing Activities

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

M. Doehler was reviewer for Mechanical Systems and Signal Processing, Journal of Sound and Vibration, Journal of Civil Structural Health Monitoring, Engineering Structures.

J. Dumoulin was reviewer for Quantitative Infrared Thermography Journal, GI Journal (EGU), SFT conference, Engineering Geology, International Journal of Pavement Research and Technology, Remote sensing of environment, Structural Health Monitoring, Composites Structures

F. Gillot was reviewer for Structural and Multidisciplinary Optimization, Applied Mathematical Modelling, Shock and Vibration, Applied Sciences, Lubricants

8.1.3. Invited Talks

M. Doehler, “Détection de changements dans des modèles physiques pour la surveillance vibratoire en génie civil”, GdR ISIS, Paris on March 15th 2018.

L. Mevel, "Données, SHM et analyse statistique", SHM France meeting, Saclay, France on March 15th 2018.

L. Mevel presented a talk "Localisation de défaut dans les structures mécaniques à partir de mesures vibratoires." at Polytec Blois, on October 11th 2018.

J. Dumoulin presented a talk “Review on past to present achievements in Non Destructive Testing by active infrared thermography and current prospects” at International School of Quantum Electronics, Progress in Photoacoustic and Photothermal Phenomena: Focus on BIOMEDICAL, NANOSCALE, NDE and Thermophysical phenomena and technologies, 6-12 September 2018, Erice, Italie.

L. Ibos, T-T. Ha, V. Feuillet, S. Thebault, K. Zibouche, R. Bouchie, J. Weaytens, Z. Djatouti, **J. Dumoulin**, V. Le Sant, « Problématique de l’estimation de la résistance thermique de parois courantes de bâtiments par thermographie infrarouge : apport et limitations de la réduction de modèles », Journée thématique de la Société Française de Thermique (SFT) sur « Méthodes inverses et thermique du bâtiment: réduction et identification de modèles », Paris, 2 Mai 2018.

8.1.4. Leadership within the Scientific Community

V. Le Cam organized the 1st SHM France meeting in Saclay on MArch 15th 2018, together with CEA and Precend.

8.1.5. Scientific Expertise

V. Le Cam was involved in an expertise dealing with electromagnetic susceptibility of axle detectors for National French Railway Company (SNCF).

8.1.6. Research Administration

V. Le Cam is member of the scientific council of WEN (West Electronic Network) since 2014, which is a cluster of about 200 companies, academics and research laboratories active in electronics. During 2017, he has been involved amongst others in meetings and selection of R&D projects, PhD and post-doc funding, international mobility.

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

J. Dumoulin

- Licence Professionnelle TAM : thermographie infrarouge active, 12h, Université Paris-Est, France
- Master 2 MMMRI (Maintenance et Maîtrise des Risques Industriels), contrôle non destructif par thermographie infrarouge active, 24h, Université Paris-Est, France
- Master 2 ITII, 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), France.
- Technical Skills Training for Master 2, PhD and Post-Doctoral on InfraRed Thermography : Industrial case studies IRT, at 1st Annual General Meeting of On Duty project, 5th June 2018, 1h30, Laval University, Québec, Canada.

V. Le Cam

- Master 2 Civil engineering, Structural Monitoring, 4h, Université de Nantes, France
- Licence 3 Professional SEICOM, 3h of theoretical lessons and 20H of practical lessons on Embedded and Smart Systems, Université de Nantes, France
- ESEO, 16h, practical lessons on embedded and smart systems under Linux, France
- Master 2 Electrical Engineering (GEII), 4h on electronic systems and Structural Monitoring, Université Bretagne Sud, France

M. Doehler

- Cycle préparatoire intégré, STPI, mathématiques, 48h TD, INSA Rennes, France

X. Chapeleau

- Licence Pro Mesures physiques, Mesures optiques, 15h, IUT de St Nazaire, Université de Nantes, France

T. Toullier

- Master 1, TP Capteurs (12h), contrôle, commandes, École Centrale de Nantes, France
- Foundation Master, TD Programming and Data Analysis (14h), École Centrale de Nantes, France

F. Gillot

- Master 1, Conception optimale robuste de systèmes mécaniques (10h), École Centrale de Lyon, France
- Master 1, Dynamique des systèmes biologiques humains (4h), École Centrale de Lyon, France
- Formation initiale des ingénieurs de l'École Centrale de Lyon, TP, TD, BE, niveau L3, (50h), France

8.2.2. 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 : Bian Xong, *Vibration analysis by video image processing for civil engineering structure monitoring*, Q. Zhang, V. Balthazar. Ecole doctorale MathsTIC, Université de Rennes 1, since October 2018.

Ludovic Gavérina post-doctoral project on in-situ measurement of thermal resistance of building envelopes, J. Dumoulin, march 2017- february 2019.

PhD : Nicolas Le Touz. *Design and study of positive energy transport infrastructures: from thermo-mechanical modeling to the optimization of such energy systems* J. Dumoulin. Ecole Centrale Nantes (ECN), defended in November 2018.

PhD : Thibaud 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 MathSTIC, Université de Rennes 1, since November 2016.

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

PhD : David Pallier, *Sensor Enhancement to Augmented Usage and Reliability*, S. Pillement, IETR, V. Le Cam, Ecole doctorale MathSTIC

PhD : Alexander Mendler, *Vibration-based structural health monitoring of road bridges*, C. Ventura and M. Doehler. University of British Columbia, Vancouver, Canada, since September 2018.

8.2.3. Juries

Q. Zhang participated in the PhD jury of Kokou Langueh on December 6th, 2018 at Centrale Lille.
J. Dumoulin participated in the PhD jury of Lei Lei on July 16th, 2018 at Laval University Québec.
F. Gillot participated in the PhD jury of Melaine Desvaux on July 9th, 2018 at ENS Rennes.
L. Mevel participated in the PhD jury of Martin D. Ulriksen on April 20th, 2018 in Aalborg.

8.3. Popularization

J. Dumoulin presented a talk on "Surveillance thermique long terme" at Blue Day event organized by the Pole Mer Bretagne Atlantique on "Maintenance des infrastructures / Instrumentation / Suivi en service / durée de vie et prolongation / nouvelles agressions" , Brest, November 14th, France.

J. Dumoulin presented the COP21 solar hybrid road demonstrator at Loire- Atlantique event : "Inventons la route de demain", journées enseignements et perspectives, Fay de Bretagne, November 5th, France.

J. Dumoulin presented a talk "Routes à énergie positive" at Escales Génie Civil, Saint-Nazaire, November 22nd, France.

8.3.1. Internal or external Inria responsibilities

L. Mevel is member of CLHSCT committee in Rennes.

L. Mevel is member of Comité de centre committee in Rennes.

M. Doehler is member of Comité de centre committee in Rennes.

8.3.2. Interventions

M. Doehler participated to Journée de la science on October 5th 2018.

8.3.3. Creation of media or tools for science outreach

A damage localization mockup has been developed and installed in the showroom of Inria Rennes [43]. It has been the support of I4S presence during the Fête de la Science on october 5th, where several highschool classes were introduced to physics and statistics by means of our demonstration mock-up.

MCTAO Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

Members of the team have been involved in creating a series of conferences on “The cut locus: A bridge over differential geometry, optimal control, and transport”, together with Japanese colleagues, see motivations in Section 3.2 . The first one took place in Bangkok, Thailand, in 2016 and the second one was organized this year, September 3-6 in Sapporo, Japan. There are plans to organise the third conference in Nice in 2020.
J.-B. Caillau and L. Rifford were members of the scientific and organising committee for this second edition.

J.-B. Caillau was member of the Scientific committee of the PGMO days 2018, hosted by EDF labs in Saclay, and supported by the Fondation Mathématique Jacques Hadamard (FMJH). The conference gathered about 280 scientists working in optimization and data science. Together with H. Zidani (ENSTA Paristech), J.-B. Caillau organized two sessions of invited talks on "Optimal control and applications" during the conference.

J.-B. Caillau is chair (together with D. Auroux, UCA) of the 19th French-German-Swiss conference on Optimization that will take place in Nice in September 2019. This conference is the main European biennial event in optimization in the broad sense.

10.1.2. Journal

B. Bonnard is a member of the editorial board of the *Pacific Journal of Mathematics for Industry*.

10.1.3. Invited Talks

B. Bonnard, J.-B. Pomet and J. Rouot gave three invited talks at the conference Dynamics, Control, and Geometry, Banach center, Warsaw (Poland): “Sub-Riemannian geometry and the Copepod Micro–swimmer”, “Geometric and numerical methods in optimal control for the time minimal saturation of a pair of spins”, “Dynamic equivalence and flatness of control systems: some results and open questions”.

Olivier Cots gave an invited talk at PGMO Days. Olivier Cots, Bernard Bonnard, Jérémy Rouot and Thibaut Verron, “Geometric and numerical methods for the saturation problem in Magnetic Resonance Imaging”.

J.-B. Pomet gave an invited talk at the 2^{nd} conference on “The cut locus: A bridge over differential geometry, optimal control, and transport”, September 3-6, Sapporo, Japan.

P. Lissy gave two seminars at Fudan University, Shanghai, China (February).

P. Lissy gave two plenary talks at *PICOF conference*, Beyrouth, Libanon (June) and at *Workshop on Microlocal analysis, numerical analysis and kinetic equations*, Madrid, Spain (February).

J.-B. Caillau gave the following invited talks:

- “Optimal control of slow-fast mechanical systems” (in January), *UCA Complex days*, Nice
- “Smooth and broken Hamiltonian curves in optimal control” (in February), *Recent advances in Hamiltonian dynamics and symplectic topology*, Padova

L. Dell’Elce gave the following seminars:

22/2/2018 *Robust trajectory design using invariant manifolds. Application to the asteroid (65803) Didymos* at Astrogeo, Sophia Antipolis, France.

7/5/2018 *Two-phase averaging of optimal control systems with application to the Eath-Moon transfer* at JAXA, Sagamihara, Japan.

9/7/2018 *Two-phase averaging of optimal control systems* at Technion, Haifa, Israel.

10.1.4. Leadership within the Scientific Community

J.-B. Caillau is member of the following committees:

- Conseil scientifique du GdR Calcul
- Conseil scientifique de l'Institut de Mécanique Céleste et de Calcul des Éphémérides (Observatoire de Paris)
- Conseil scientifique PGMO, Fondation Mathématique Jacques Hadamard
- Jury du prix de thèse PGMO

J.-B. Caillau, L. Dell'Elce and J.-B. Pomet are members of the Centre Spatial Universitaire UCA (projet CubeSat).

10.1.5. Scientific Expertise

J.-B. Caillau and L. Giraldi were hired for a one day expertise for Smart'n Go (startup working in marine routing).

10.1.6. Research Administration

J.-B. Caillau is

- co-organizer of the Séminaire de géométrie hamiltonienne of Sorbonne Université
- member of the Conseil Scientifique 3IA (project on AI supported by Nice-Sophia Antipolis)

Laetitia Giraldi is

- a member of CSD (*Comité du Suivi Doctoral*) at Inria Sophia-Antipolis,
- a redactor of the meeting reports of the *Comité des Équipes-Projets* at Inria Sophia-Antipolis.

Jean-Baptiste Pomet is

- a member of the steering committee of the Center for Planetary Origin (C4PO),
- a member of the scientific council of Académie 2 "Complex system", both for Université Côte d'Azur (UCA),
- an elected member of Commission d'Évaluation (Inria permanent evaluation committee).

Ludovic Rifford is the Executive Director of the CIMPA (Centre International de Mathématiques Pures et Appliquées).

Pierre Lissy is elected member of the "CCR" of the CEREMADE (committee in charge of the recruitment at Dauphine, notably for ATER, months of invited and composition of hiring committees).

Pierre Lissy is member of the team of the website "Opération Postes".

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

B. Bonnard taught 220 hours at undergraduate level (ESIREM engineering school)

J.-B. Caillau taught 200 hours at L3, M1 and M2 level (Polytech Nice Sophia, Universié Nice Sophia).

L. Giraldi taught 10 hours in the Master 2 recherche, Cell Physics (Université de Strasbourg). She also teaches in Classe préparatoire aux grandes écoles d'ingénieurs (Centre International de Valbonne) as a interrogatrice in MP* and MPSI (4 hours per week).

P. Lissy gave a six hour lecture on "Spectral Geometry" at the CIMPA spring school "PDEs and geometry" (May 2018, Jijel, Algeria).

J.-B. Caillau is director of the Applied Math. & Modelling department of Polytech Nice Sophia.

J.-B. Caillau and L. Giraldi are members of the jury of Agrégation externe de mathématiques.

P. Lissy was coordinator of a work group on the recast of the Teaching in Analysis for the initial education in Maths at Université Paris-Dauphine.

10.2.2. Supervision

PhD : Michaël Orieux, "Quelques propriétés et applications du contrôle en temps minimum" [1], Université Paris Dauphine, November 27, 2018, co-supervised by J.-B. Caillau and J. Féjoz (Univ. Paris-Dauphine).

PhD in progress : Sébastien Fueyo, "Testing stability of nonlinear amplifier by frequency-domain methods", started October, 2016, co-supervised by J.-B. Pomet and L. Baratchart (FACTAS team).

PhD in progress : Yacine El alaoui-faris, "modeling magneto-elastic micro-robot from theory to experiment", started October, 2017, co-supervised by L. Giraldi, J.-B. Pomet and Stephane Régnier (Sorbonne Université).

PhD in progress : Clément Moreau, "Contrôlabilité de systèmes en dimension finie ou infinie issus du vivant", started September, 2017, co-supervised by L. Giraldi, P. Lissy (Univ. Paris-Dauphine) and J.-B. Pomet.

PhD in progress : Agustin Yabo, "Control of biological processes", started September, 2018, co-supervised by J.-B. Pomet and J.-L. Gouzé (Biocore team).

PhD in progress : Luca Berti, "Modeling magneto-elastic micro-robot using PDE", started October, 2018, co-supervised by L. Giraldi and C. Prud'Homme (Université de Strasbourg).

10.2.3. Juries

B. Bonnard was a reviewer of Sofya Maslovskaya's PhD (ENSTA ParisTech), and he sat in the jury for Toufik Bakir's Habilitation defense (Univ. de Bourgogne Franche Comté).

J.-B. Caillau was a reviewer of Ivan Beschastnyi PhD thesis (SISSA, September 2018), Francesca Chittaro Habilitation (Univ. Toulon, December 2018), Antoine Olivier PhD thesis (Sorbonne Université, October 2018), Cédric Rommel PhD thesis (École Polytechnique, October 2018), and he sat in the jurys of Clément Gazzino PhD thesis (Univ. Toulouse, January 2018), Ricardo Bonalli PhD thesis (Sorbonne Université, July 2018).

J.-B. Pomet was a reviewer of Riccardo Bonalli's PhD (Univ. Paris Sorbonne), and he sat in the jury for Sofya Maslovskaya's PhD (ENSTA ParisTech) and for Toufik Bakir's Habilitation defense (Univ. de Bourgogne Franche Conté).

L. Rifford was a reviewer of Vincenzo Basco's PhD (Sorbonne Université) and sat in the jury for Nicolas Juillet's Habilitation à Diriger des Recherches (Université de Strasbourg).

Pierre Lissy has been a member of hiring committees for "Maître de Conférences" positions at Université Paris-Dauphine (2 positions) and Université Sorbonne Université (1 position).

10.3. Popularization

10.3.1. Internal or external Inria responsibilities

Clément Moreau is a member of the team « équipe actualités » of Images des Mathématiques since October, 2018.

J.-B. Caillau is member of the MASTIC initiative at Inria Sophia (Médiation et animation scientifiques Inria) and delivers regular talks in high school or college.

10.3.2. Articles and contents

Clément Moreau participated in the radio show « La méthode scientifique » on March 7, 2018.

Clément Moreau participated in the national competition « Ma thèse en 180 secondes ».

10.3.3. Education

Lamberto Dell'Elce is involved in the PoBot challenge promoted by MEDITES. Specifically he supervises a class in the College Emile Roux in Cannes.

10.3.4. Interventions

Clément Moreau participated in the « journées portes ouvertes » at Inria Sophia Antipolis in the framework of the 2018 « Fête de la Science », October 7, 2018, and in a scientific discovery workshop for secondary school students at the concrete Art Museum, Mouans-Sartoux, October 11, 2018.

Lamberto Dell'Elce gave the talk "CubeSats: Concevoir et Realiser un Satellite à l'Université" at the *Cafe In* meeting held at Inria Sophia on June 6, 2018, and for high scholl students during the stage MathC2+ in June, 2018.

NECS Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. Member of the Organizing Committees

The team organized the international ERC Scale-FreeBack workshop on "Analysis and Control of Large-Scale Complex Networks", Grenoble, September 10-11th, 2018 (http://scale-freeback.eu/workshop-on-analysis-and-control-of-large-scale-complex-networks-10-11-sept-2018-grenoble/).

M. L. Delle Monache organized a mini-symposium on "Modélisation et gestion du trafic routier", 44e Congrès National d'Analyse Numérique, May 2018 (with P. Goatin, Acumes team).

M. L. Delle Monache organized a workshop on "Traffic flow control via PDE techniques", CDC, December 2018 (with Nikolaos Bekiaris-Liberis, Delphine Bresch-Pietri and Rafael Vazquez).

Team members organized the following invited sessions at the European Control Conference ECC 2018, Cyprus, June 2018:

- "Model reduction and control in large-scale networks" (P. Frasca and C. Canudas de Wit)
- "Multi-agent network games" (F. Garin, with S. Grammatico from Delft Univ. of Technology)

9.1.2. Scientific Events Selection

9.1.2.1. Member of the Conference Program Committees

C. Canudas de Wit has served as Associate Editor at Large for the American Control Conference ACC 2019.

P. Frasca has served as Associate Editor in the conference editorial boards for the 7th IFAC Workshop on Distributed Estimation and Control in Networked Systems and the 23rd International Symposium on Mathematical Theory of Networks and Systems (MTNS).

F. Garin is Associate Editor in the IEEE Control System Society Conference Editorial Board (this year, she served for CDC 2018, ACC 2019) and Associate Editor in the European Control Association (EUCA) Conference Editorial Board (this year, she served for ECC 2019).

H. Fourati was member of:

- the International Program Committee (IPC) of international conferences STA'18, ICCAD'18, ICITE'18.
- the International Program Committee (IPC)/Associate Editor for contributed papers for the IEEE Conference on Control Technology and Applications (CCTA'18), Copenhagen (Denmark), Aug. 2018;
- the Technical Program Committee (TCP) for the International Conference on Indoor Positioning and Indoor Navigation (IPIN'18), Nantes (France), Sep. 2018;
- the committee of the reviewing phase of the 21st Euro Working Group on Transportation Meeting (EWGT'18), Braunschweig (Germany), Sep. 2018.

9.1.2.2. Reviewer

Team members 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), IFAC Workshop on Control for Transportartion Systems (CTS), IEEE Intelligent Transportation Systems Society Conference, Transportation Research Board Annual Meeting.

9.1.3. Journal

9.1.3.1. Member of the Editorial Boards

C. Canudas de Wit is Associate Editor of the IEEE Transactions on Control of Networks Systems IEEE-TCNS (since June 2013) and Editor of the Asian Journal of Control AJC (since 2010).

P. Frasca is Subject Editor of the International Journal of Robust and Nonlinear Control (Wiley) (since February 2014), Associate Editor of the IEEE Control System Letters (from February 2017) and Associate Editor of the Asian Journal of Control (Wiley) (since January 2017).

H. Fourati is Associate Editor of the Asian Journal of Control (Wiley) (since January 2016) and of the Open Transportation Journal https://benthamopen.com/TOTJ/editorial-board. He has also been guest editor of the special issue "Multi-sensor Integrated Navigation and Location based services applications" for International Journal of Distributed Sensor Networks (IJDSN), 2017-2018 (http://journals.sagepub.com/topic/collections-dsn/dsn-1-msinalbsa/dsn) and lead guest editor of the special issue "Recent Advances on Data Fusion, Estimation in Navigation and Control" for Asian Journal of Control (AJC), 2018.

9.1.3.2. Reviewer - Reviewing Activities

Team members 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, Int. Journal of Robust and Nonlinear Control, Elsevier Transportation Research Part B, IEEE Trans. on Intelligent Transportation Systems, IEEE/ASME Trans. on Mechatronics, IEEE Trans. on Instrumentations and Measurements, IEEE Sensors journal, IEEE Trans. on Robotics, AIMS Networks and Heterogeneous Network (NHM), Wiley Mathematical Methods in the Applied Sciences (MMAS), Journal of Mathematical Analysis and Applications (JMMA), Journal of Nonlinear Science and Applications (JNSA), Journal of the Franklin Institute, AMS Mathematical Reviews, Asian Journal of Control.

9.1.4. Invited Talks

- C. Canudas de Wit, "Model and Control of Large scale systems", plenary talk at IFAC-NecSys'18, Groningen, The Netherlands, August 2018.
- C. Canudas de Wit, "Control of Large scale Urban networks: a new perspective", plenary talk at IFAC-CTS'18, Savona, Italy, June 2018
- C. Canudas de Wit, "Scale-FreeBack", pitch talk at Transport Research Arena, Vienna, Austria, April 2018 .
- C. Canudas de Wit, "Towards Scale-Free Control of Large-scale Traffic Networks" and M. L. Delle Monache, "Micro-macro traffic modeling for estimation and control", First SoPhy International Workshop on Societal-Scale Cyber-Physical Transport Systems Workshop, Stockholm, Sweden, September 2018.
- M. L. Delle Monache, "Can big data help traffic flow control?", Workshop: Traffic flow control via PDE Techniques, IEEE-CDC Conference, Miami Beach, USA, December 2018.
- M. L. Delle Monache, "Control and estimation of traffic flow using autonomous vehicles", Joint meeting of the Italian Mathematical Union, the Italian Society of Industrial and Applied Mathematics and the Polish Mathematical Society, Wroclaw, Poland, September 2018.
- M. L. Delle Monache, "Riemann solver for a macroscopic double-lane roundabout model", 15th IFAC Symposium on Control in Transportation Systems, Savona, Italy, June 2018.
- M. L. Delle Monache, "Control of traffic: from ramp metering to autonomous vehicles", Institute for Software Integrated Systems, Vanderbilt University, USA, May 2018.
- M. L. Delle Monache, "Control of traffic flow: from ramp metering to autonomous vehicles", Seminar of the department of mathematics, University of Alabama, USA, April 2018

- M. L. Delle Monache, “Two-dimensional macroscopic model for large scale traffic network”, Incontro Scientifico su Modellizzazione ed Analisi di Problemi di Folle e Traffico, Politecnico di Torino, Italy, April 2018.
- M. L. Delle Monache, “Les mathématiques cachées du trafic routier”, ISN Conference, Académie de Grenoble, Inria Grenoble – Rhône-Alpes, France, March 2018.
- P. Frasca, “The harmonic influence in social networks and its distributed computation by message passing”, IXXI, ENS Lyon, July 3, 2018
- P. Frasca, “Randomization and quantization in opinion dynamics”, IRSTEA, Clermont-Ferrand, March 14, 2018.
- F. Garin, “Input-and-state observability of structured systems”, Paths in Mathematical Systems Theory workshop, Torino (Italy), Feb. 2018.

9.1.5. Leadership within the Scientific Community

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

- IEEE-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).

C. Canudas de Wit is member of the advisory board (2017-21) of the project ”Societal-Scale Cyber-Physical Transport Systems” supported by the Swedish Strategic Research Foundation, KTH Sweden.

P. Frasca is member of the “Comité de Direction du GdR MACS ”, term 2019-2023.

P. Frasca reviewed project proposals for the ERC and the Italian Ministry of Scientific Research; A. Kibangou reviewed project proposals for ANR, NRF (South-African research agency), and ERC.

9.1.6. Research Administration

C. Canudas de Wit is a member of the COST-Inria-RA (Conseil d’Orientation Scientifique et Technologique, Inria Rhône-Alpes), since 2017.
F. Garin is member of two local committees at Inria Rhône-Alpes: Comité des Emplois Scientifiques (post-docs, délégations) since 2015 and Comité des Études Doctorales (PhD grants CORDI-S) since 2016.
A. Kibangou is:

- Elected member of the research department MSTIC (mathematics, information and communication sciences) of Univ. Grenoble Alpes
- Co-head of the PCS (Pervasive Computing Systems) action of Persyval-Lab
- Academic director (L2) IUT1 (GEII)
- Co-head for higher studies opportunities (Responsable poursuite d’études) (IUT1-GEII)

H. Fourati is

- Member of the Department of Electrical Engineering Council, IUT1 Grenoble, France (2018-2021)
- Member of CNU61 (Conseil national des universités, Génie informatique, Automatique et Traitement du Signal) since 2016.
- In charge of communication mission and visits to high school within the Department of Electrical Engineering, IUT1 Grenoble, France (2017-present).

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Master and PhD: M.L. Delle Monache, Traffic flow and crowd dynamics: modeling and computing, 18h, ED MSTII, Univ. Grenoble Alpes, France.

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

Licence: H. Fourati, Mathématiques, 30h, L2, IUT1 (GEII1), Univ. Grenoble Alpes, France.

Licence: H. Fourati, Informatique Industrielle, 95h, L1, IUT 1 (GEII), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Automatique, 75h, L2, IUT1(GEII), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Mathématiques, 44h, L2, IUT1 (GEII), Univ. Grenoble Alpes, France.

Licence: A. Kibangou, Mathématiques, 126h, L1, IUT1 (GEII), Univ. Grenoble Alpes, France.

9.2.2. Supervision

PhD: Andrés Alberto Ladino Lopez, Traffic state estimation and prediction in freeways and urban networks, Univ. Grenoble Alpes, March 2018, co-advised by C. Canudas de Wit, A. Kibangou and H. Fourati.

PhD: Sebin Gracy, Input and state observability of linear network systems with application to security of cyber-physical systems, Univ. Grenoble Alpes, Nov. 2018, co-advised by A. Kibangou and F. Garin.

PhD: Stéphane Durand, Analysis of best response dynamics in potential games, Univ. Grenoble Alpes, Dec. 2018, 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: Nigina Toktassynova, Simulation and research of industrial flow control systems of the enterprise based on MES, from Oct. 2016, co-advised by H. Fourati and Batyrbek Suleimenov (Kazakh National Research Technical University).

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.

PhD in progress: Martin Rodriguez-Vega, Traffic density, traveling time and vehicle emission estimation in large-scale traffic networks, from Oct. 2017, co-advised by C. Canudas de Wit and H. Fourati.

PhD in progress: Muhammad Umar B. Niazi, State-state estimation design and optimal sensor placement algorithms for large-scale evolutionary dynamical networks, from Dec. 2017, co-advised by C. Canudas de Wit and A. Kibangou.

PhD in progress: Thembani Moyo, Origin and destination modeling and estimation for smart mobility, from May 2018, co-advised by A. Kibangou and W. Musakwa (Univ. of Johannesburg).

PhD in progress: Denis Nikitin, Scalable large-scale control of network aggregates, from Sept. 2018, co-advised by C. Canudas de Wit and P. Frasca.

PhD in progress: Liudmila Tumash, Traffic control in large-scale urban networks, from Sept. 2018, co-advised by C. Canudas de Wit and M. L. Delle Monache.

PhD in progress: Bassel Othman, Dynamic optimization of road traffic in a large-scale urban network from Oct. 2018, co-advised by C. Canudas de Wit and G. De Nunzio.

PhD in progress: Makia Zmitri, Estimating the attitude by IMU, magnetic and vision measures: an automatic control approach, from Oct. 2018, co-advised by H. Fourati and C. Prieur.

9.2.3. Juries

- P. Frasca was committee member of the PhD defence of Zhiyang Ju. Thesis: *Persistent Communication Connectivity of Multi-agent Systems*. University of Melbourne, Australia. PhD advisor: Dragan Nesic and Iman Shames. 2018
- P. Frasca was committee member of the PhD defence of Pierre-Yves Chevalier. Thesis: *Inhomogeneous Products of Stochastic Matrices with Application to Consensus Systems*. Université catholique de Louvain, Louvain-la-Neuve, Belgium. Ph.D. advisors: Julien Hendrickx and Raphael Jungers, June 2018
- P. Frasca was committee member of the PhD defence of Domenico Tangredi. Thesis: *Consensus in Heterogeneous Opinion Dynamics Networks*. University of Sannio, Benevento, Italy. Ph.D. advisor: Francesco Vasca, 2018.
- H. Fourati was committee member of the PhD defence of Fadoua Taia-Alaoui, IFSTTAR / Univ. Nantes, Dec. 2018.
- F. Garin was scientific assessor for the promotion of Maben Rabi to 'oavlönad docent', Chalmers University of Technology (Sweden), Jan. 2018.
- A. Kibangou was a reviewer of the PhD thesis of Thomas Brault "Étude des algorithmes de fusion de données pour estimer l'orientation d'un objet", Sorbonne Universités, defended November 8th, 2018.
- A. Kibangou was a reviewer of the thesis of Smart Dumba "Modelling Signalised Intersections' Capacity under the Impact of Minibus Public Transport in Harare, Zimbabwe", University of Zimbabwe. To be defended in January 2019.

9.3. Popularization

9.3.1. Articles and contents

P. Frasca has co-authored a column on the IEEE Control Systems Magazine about the activities of the Technical Committee on Networks and Communications Systems [67].

9.3.2. Education

M. L. Delle Monache gave a talk on "Les mathématiques cachées du trafic routier" to the high school teachers in the framework of the ISN Conference in collaboration with the Académie de Grenoble. The video of the conference is available at https://www.canal-u.tv/video/inria/les_mathematiques_cachees_du_trafic_routier.44275.

9.3.3. Interventions

Vadim Bertrand presented demos of the GTL-Ville:

- at *Club PTV Vision* (https://discover.ptvgroup.com/Club_PTV_Vision_2018), on Oct. 4th, in Paris
- at *Rencontres Inria-industrie* (https://www.inria.fr/innovation/recherche-partenariale-transfert/rencontres-inria-industrie/presentation), on Nov. 20th, in Paris

NON-A POST Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Selection

9.1.1.1. Member of the Conference Program Committees

- Richard J.-P., EUCA-IEEE ECC, Limassol, Cyprus
- Richard J.-P., IFAC TDS, Budapest, Hungary
- Richard J.-P., IARA VEHICULAR, Venice, Italy
- Efimov D., IFAC CHAOS, Eindhoven, Netherlands
- Efimov D., IFAC MICNON, Guadalajara, Mexico

9.1.1.2. Reviewer

The members of the team serve as reviewers to all major conferences in the field: IEEE CDC, ECC, ACC *etc*.

9.1.2. Journal

9.1.2.1. Member of the Editorial Boards

- Polyakov A., International Journal of Robust and Nonlinear Control
- Polyakov A., Journal of Optimization Theory and Applications
- Efimov D., IFAC Journal on Nonlinear Analysis: Hybrid Systems
- Efimov D., Asian Journal of Control
- Efimov D., IEEE Transactions on Automatic Control

9.1.2.2. Reviewer - Reviewing Activities

The members of the team serve as reviewers to all major journals in the field: IEEE Trans. Automatic Control, Automatica, Systems & Control Letters, SIAM Journal on Optimization and Control, Int. Journal of Robust and Nonlinear Control *etc*.

9.1.3. Research Administration

- Richard J.-P., Investigator for the CNRS FR TTM
- Efimov D., Chair of EECI PhD Award

QUANTIC Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Scientific Events Organisation

8.1.1.1. General Chair, Scientific Chair

Pierre Rouchon was the main organizer of the spring thematic quarter at Institut Henri Poincaré entitled "Measurement and control of quantum systems: theory and experiments" (16 April – 13 July 2018). This thematic quarter includes courses, lectures and conferences. In particular a research school of one week at CIRM, two 3-day workshops in May and June and the 2018 issue of PRACQSYS conference in July, were organized in this framework. This thematic quarter involved several hundred of participants. See IHP web page (http://www.ihp.fr/en/CEB/T2-2018), CIRM web page (https://conferences.cirm-math.fr/1732.html) and the specific quarter web site (https://sites.google.com/view/mcqs2018/home).

8.1.1.2. Member of the Organizing Committees

- Zaki Leghtas co-organized a conference on quantum computing ICOQC 2018 at ENS Paris (https://icoqc.sciencesconf.org).
- Mazyar Mirrahimi was a co-organizer of the PRACQSYS conference at IHP in July 2018 (https://sites.google.com/view/mcqs2018/pracqsys-2018).

8.1.2. Journal

8.1.2.1. Member of the Editorial Boards

Pierre Rouchon is member of the editorial board of Annual Reviews in Control.

8.1.2.2. Reviewer - Reviewing Activities

- Zaki Leghtas and Mazyar Mirrahimi were reviewer of Physical Review Journals.
- Pierre Rouchon and Alain Sarlette were reviewer for several automatic control and dynamical systems journals and conferences.

8.1.3. Invited Talks

- Zaki Leghtas: Sirteq 2018. Institut d'optique Paris. Invited by Patrice Bertet.
- Zaki Leghtas: ONE-QOS workshop. Max Planck, Erlangen, Germany. Invited by Florian Marquardt.
- Zaki Leghtas: IHP workshop on quantum control and feedback, Paris, France. Invited by Eleni Diamanti.
- Zaki Leghtas: LIA CNRS-Université de Sherbrooke workshop, Saint-Rémy, France. Invited by Denis Vion.
- Zaki Leghtas: University of Berkeley. Berkeley, USA. Invited by Irfan Siddiqi.
- Zaki Leghtas: Rigetti Quantum Computing. Berkeley, USA. Invited by Chad Rigetti.
- Pierre Rouchon: lecture at the QUACO ANR Meeting in Besançon, September 24-26, Models and feedback issues for open quantum systems.
- Pierre Rouchon: plenary speaker at Mexican Annual Conference on Automatic Control. 10-12 October 2018, San Luis Potosi, Dynamical models and feedback issues for super-conducting quantum circuits.
- Pierre Rouchon: 2-hour course in the Colloquium of the Physics Department, ENS-Paris, October 23 (introduction to quantum cryptography, computation and error correction).

- Alain Sarlette: dynamical systems seminar series, March 2018, Jussieu.
- Alain Sarlette: seminar at IHP trimester on Quantum Control, May 2018.
- Alain Sarlette: Praqcsys: Principles and Applications of Control in Quantum Systems, IHP, Paris, July 2018.
- Mazyar Mirrahimi: American Physical Society March Meeting, Los Angeles, March 2018.
- Mazyar Mirrahimi: Semi-plenary speaker at MTNS (Mathematical Theory of Networks and Systems), Hong Kong, July 2018.
- Mazyar Mirrahimi: Centre de Recherche Mathematique de Montreal, Octobre 2018.
- Mazyar Mirrahimi: 4-hour course at Institut d'Optique, Introduction to Quantum Computing, June 2018.
- Alain Sarlette: lectures on quantum control and quantum computing at the Ecole d'Automatique de Grenoble summer school, August 2018
- Pierre Rouchon, Alain Sarlette, Rémi Azouit, Paolo Forni and Francesca Chittaro have given a lecture series about "adiabatic elimination for open quantum systems" at the IHP trimester on Quantum Control.
- Jérémie Guillaud: Yale university, Nov 2018.

8.1.4. Research Administration

- Pierre Rouchon is a member of the scientific committee of LAGEP (Laboratoire d'Automatique et de Génie des Procédés) since 2017.
- Pierre Rouchon is a membre of the "Conseil Scientifique du DIM Math Innov" since 2017.
- Pierre Rouchon is a member of the "Conseil de la recherche de PSL " since 2016.
- Pierre Rouchon is a member of the "Conseil Scientifique du Conservatoire National des Arts et Metiers" since 2014.
- Mazyar Mirrahimi is the co-president of Inria's comité des emplois scientifiques.
- Mazyar Mirrahimi was a member of ANR Comité d'Evaluation Scientifique on Quantum Technologies.

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

Cycle Ingénieur : Mazyar Mirrahimi, Automatic Control with Applications in Robotics and in Quantum Engineering, 8 hours amphi and 8 hours TD, 3rd year, Ecole Polytechnique, France.

Cycle Ingénieur : Mazyar Mirrahimi, Contrôle de modèles dynamiques, 36 hours TD, 2nd year, Ecole Polytechnique, France.

Cycle Ingénieur : Mazyar Mirrahimi, Module algorithmique Quantum Control, 24 hours TD, 2nd year, Ecole Polytechnique, France.

Master: Mazyar Mirrahimi and Pierre Rouchon, Dynamics and control of quantum systems, 18 hours amphi, M2, Jussieu, France.

Cycle Ingénieur: Alain Sarlette, Probabilities and Stochastic Processes, 24 hours TD, Mines Paristech, France.

Master: Alain Sarlette, Robotics, 24 hours, Ghent University, Belgium.

Cycle Ingénieur : Zaki Leghtas, Quantum Mechanics and Statistical Physics, Mines ParisTech, 12 hours, France.

Cycle Ingénieur : Zaki Leghtas, Quantum Computing, Mines ParisTech, 20 hours, France.

8.2.2. Supervision

- PhD in progress : Gerardo Cardona, "Beyond static gains in analog quantum feedback control", advisors: Pierre Rouchon and Alain Sarlette, starting date: Nov 2016.
- PhD in progress: Michiel Burgelman, "A systematic study of strongly driven and dissipative quantum systems towards high-accuracy quantum control designs", advisors: Pierre Rouchon and Alain Sarlette, starting date: Nov 2018.
- PhD in progress: Vincent Martin, "Fault-tolerance of quantum systems under continuous-time feedback stabilization", advisors: Mazyar Mirrahimi and Alain Sarlette, starting date Oct 2018.
- PhD in progress: Jérémie Guillaud, "Modular architecture for quantum information processing", advisor: Mazyar Mirrahimi and Pierre Rouchon, starting date Oct 2017.
- PhD in progress: Lucas Verney, "Robust processing of quantum information with superconducting circuits", advisor: Mazyar Mirrahimi and Zaki Leghtas, starting date Oct 2016.
- PhD in progress: Raphaël Lescanne, “Engineering Multi-Photon Dissipation In Superconducting Circuits For Quantum Error Correction”, advisors: Zaki Leghtas and Takis Kontos, starting date Sept 2016.
- PhD in progress: Marius Villiers, “Probing the spin entanglement of single Cooper pair”, advisors: Zaki Leghtas and Takis Kontos, starting date: September 2018.
- Alain Sarlette has been supervising 2 PhD students with his former institution UGent. Arash Farnam has successfully defended his thesis about distributed systems control in October 2018. Simon Apers has successfully defended his thesis about quantum walks on graphs in November 2018.

8.2.3. Juries

Pierre Rouchon was the president of the jury for the Habilitation thesis of Fransceca Chirraro (université de Toulon) and member of the jury for the Habilitation thesis of Nadir Farhi (université Paris-Est).

8.3. Popularization

Alain Sarlette, 5 December 2018, prospective Ordinateur Quantique at the comité de pilotage du CETIM, Senlis.

SPHINX Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

"rQUACO" is the first meeting funded by the ANR QUACO. This 3 days workshop of quantum control gathers 25 physicists and mathematicians in September in Besançon and was co-organized by N. Boussaïd (UBFC Besançon), T. Chambrion (U. Lorraine) and S. Sugny (UBFC Dijon).

9.1.1.2. Member of the Organizing Committees

- Xavier Antoine was a member of the scientific committee of ECT2018, The 10th International Conference on Engineering Computational Technology, Barcelona, Spain, 4–6 September 2018. He was also a co-organiser of the workshop on Mathematical and Computational Methods for Quantum Systems, CRM Montréal, 11-14th December 2018.
- Thomas Chambrion was a member of the organizing committee of rQUACO, which took place under the framework of the ANR QUACO;
- David Dos Santos Ferreira was a co-organizer (with Laurent Thomann) of the "*Journées EDP*" (Obernai, June 2018);
- Julien Lequeurre and Alexandre Munnier were co-organizers of the JEF "Journées Jeunes Edpistes" (Mars 2018, Nancy https://jef18.sciencesconf.org).
- Julie Valein was a member of the organizing committee of the meeting "Contrôle et dynamique des EDP", which took place under the framework of the ANR ISDEEC, (28–30 March 2018, http://isdeec.math.cnrs.fr/rencontres.html).

9.1.2. Journal

9.1.2.1. Member of the Editorial Boards

- Xavier Antoine is associate editor of "Multiscale in Science and Engineering" (Springer) and "International Journal of Computer Mathematics" (Taylor and Francis);
- David Dos Santos Ferreira is member of the editorial board of "Mathematical Control and Related Fields";
- Jean-Claude Vivalda is a member of the editorial board of the "Journal of Dynamical and Control Systems".

9.1.2.2. Reviewer - Reviewing Activities

- Jean-François Scheid is reviewer for the "Applied Mathematics and Optimization" journal;
- Jean-Claude Vivalda is reviewer for the "Mathematical reviews".

9.1.3. Invited Talks

- Xavier Antoine was invited to give a talk to
  - the mini-symposium "Waves and computation", Hong-Kong, 4-7 June, 2018;
  - the workshop "Méthodes numériques multi-échelles et/ou géométriques pour les équations de types cinétique ou Schrödinger,", Rennes, 12-15 June 2018;
  - the workshop "Modern Numerical Methods in Quantum Mechanics", 27-29 June 2018, Gdansk, Poland;
  - "Forum on Applied and Computational Mathematics", July 22-23, 2018, Beijing CSRC.

- Alexandre Munnier was invited to give a talk at the “Groupe de travail EDP of the IECL”;
- Julie Valein was invited to give a talk at
  - the 14th Franco-Romanian conference on applied mathematics, (Bordeaux, Auguts 27–31 2018);
  - the conference “Analysis of PDEs : unique continuation, stabilization, control and dispersive properties”, in honour of Pr. L. Robbiano – IHP, Paris, November 5–9 2018 (one hour plenary exposition);
  - 2nd DECOD Workshop (DElays and COnstraints in Distributed parameter systems) – Toulouse, November 21–23 2018 (45 minutes plenary exposition).
- Jean-Claude Vivalda was invited to give a talk at the “Séminaires et journées d’Equations aux Dérivées Partielles“ in the maths laboratory of Versailles.

9.1.4. Leadership within the Scientific Community

- Xavier Antoine is the director of the maths laboratory IECL.
- David Dos Santos Ferreira is one of the coordinators of the GDR “Analyse des EDP”. He is also the treasurer of the SMF (French mathematical society);
- Julien Lequeurre is responsable of the “Séminaire EDP de l’Institut Elie Cartan de Lorraine, site de Metz”
- Julie Valein is co-responsable of the “Séminaire EDP de l’Institut Elie Cartan de Lorraine, site de Nancy”.

9.1.5. Scientific Expertise

Julie Valein participated in a associate professor position recruitment committee at Université de La Rochelle and at Université de Bordeaux (April-May 2018).

9.1.6. Research Administration

- Karim Ramdani is member of the board of the RNBM (Réseau National des Bibliothèques de Mathématiques) and is in charge of Open Access issues (with Benoît Kloeckner). Since October 2018, he is also member of the Working Group “Publications” of the national “Comité pour la Science Ouverte” of the french ministry of Higher Education, Research and Innivation.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

Except L. Gagnon, K. Ramdadi, T. Takahashi and J.-C. Vivalda, SPHINX members have teaching obligations at "Université de Lorraine" and are teaching at least 192 hours each year. They teach mathematics at different level (Licence, Master, Engineering school). Many of them have pedagogical responsibilities.

9.2.2. Supervision

PhD defended :

- Boris Caudron, June 2018, (Thèse CIFRE Thalès) , supervisor: X. Antoine.
- Benjamín Obando defended his PhD thesis “Mathematical models for the study of granular fluids” at Santiago on 18th December 2018. Supervisors: Jorge San Martín (University of Chile) and Takéo Takahashi.

PhD in progress:

- Mohamed ID SAID, Embedded automatic control with limited computational resources, from October 2017, supervisors: T. Chambrion and G. Millerioux;
- PhD in progress: Meriem BOUGUEZZI, Reaction-diffusion system for the modeling of a corrosion phenomena, from november 2017, J.-F. Scheid (co-supervisor);

- PhD in progress: Imem JBIL, Myocardial infarction as a fluid-structure system : modeling and simulations, from mars 2017, J.-F. Scheid (co-supervisor);
- PhD in progress: Imene DJEBOUR, Control and inverse problems on fluid-structure interaction systems, from November 2017, supervisor : T. Takahashi.

9.2.3. Juries

- David Dos Santos Ferreira Jury was a member of the thesis jury of Matthieu Léautaud and Cristó bal Meroño.
- Takéo Takahashi reviewed the PhD theses of
  - Krisztián Benyó (defense on 25/09/2018 at Bordeaux);
  - Thi Minh Nhat Vo (defense on 04/10/2018 at Orléans);
  - Lamis Sabbagh (defense on 22/11/2018 at Montpellier).
- Julie Valein was a member of the thesis jury of Hawraa Nabolsi, defended in July 2018, at "Université de Valenciennes et du Hainaut-Cambrésis" (Title: "Contrôle optimal des équations d'évolution et ses applications.", Advisors : Luc Paquet and Ali Wehbe.)
- Xavier Antoine served as a referee for the PhD thesis of Huda Al Taie, (Dec. 2018, Université de Nice).

TRIPOP Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Journal

9.1.1.1. Member of the Editorial Boards

- B. Brogliato is Associate Editor at Nonlinear Analysis: Hybrid Systems.
- B. Brogliato is Associate Editor at ASME Journal of Computational and Nonlinear Dynamics.

9.1.1.2. Reviewer - Reviewing Activities

- A. Tonnelier has been reviewer for PRE (Physical Review E) and DCDS (Discrete and Continuous Dynamical Systems).
- G. James has been reviewer for IMA J. Appl. Math.
- V. Acary has been for Optimization Methods and Software, Nonlinear Dynamics, Applied Mechanics Reviews, IEEE Transactions on Robotics, Multibody Systems Dynamics, International Journal for Numerical Methods in Engineering, IFAC Conference on Modelling, Identification and Control of Nonlinear Systems, CDC 2018, SIMPAR 2018.
- B. Brogliato has been reviewer for IEEE Transactions on Automatic Control, IEEE Transactions on Robotics, IEEE Control Systems Letters, Automatica, SIAM Journal on Control and Optimization, Multibody System Dynamics.

9.1.2. Invited Talks

- G. James : invited talk at the International Symposium on Intrinsic Localized Modes (Kyoto, 01/18), speaker at the Conference on Advances in Nonsmooth Mechanics (Bristol, 06/18), lecture at the thematic school Méthodes de Dynamique Non-Linéaire pour l'Ingénierie des Structures, GDR Dynolin (Fréjus, 05/18).
- V. Acary : lecture at the thematic school Méthodes de Dynamique Non-Linéaire pour l'Ingénierie des Structures, GDR Dynolin (Fréjus, 05/18).

9.1.3. Leadership within the Scientific Community

- V. Acary is coordinator with R. Leine of the Europe Network for Nonsmooth Dynamics http://ennsd.gforge.inria.fr/.

9.1.4. Research Administration

- A. Tonnelier is member of the CED and the CLHSCT.

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

- Licence : G. James, Introduction to Dynamical Systems in UE MAP201, 18 hETD, L1, Université Grenoble Alpes.
- Licence : G. James, Normed Vector Spaces, 25 hETD, L2, Prépa INP, Grenoble.
- Master : G. James, Numerical Methods, 94 hETD, M1, Grenoble INP - Ensimag (1st year).
- Master : G. James, Dynamical Systems, 45 hETD, M1, Grenoble INP - Ensimag (2nd year).
- Master : Vincent Acary, 17H éq TD Systèmes dynamiques, ENSIMAG 2A.

- Master : Vincent Acary, 12H éq TD Systèmes dynamiques, Master ACSYON. Université de Limoges.

9.2.2. Supervision

Rami Sayoub, Influence of vibrations on multibody systems, September 2018, V. Acary and B. Brogliato.

Charlélie Bertrand, Mechanical model fro cable vibrations, October 2018, V. Acary and C.H. Lamarque.

Christelle Kozaily. Structural analysis for multi-mode DAE systems, Octobre 2018, V. Acary and B. Caillaud.

Alexandre Vieira. Commande optimale de systèmes linéaires de complémentarité, université Grenoble Alpes, 24 septembre 2018, B. Brogliato and C. Prieur.

9.2.3. Juries

- Vincent Acary, president of Ph.D. Thesis committee of Thomas Catterou (22 October 2018), Universite Aix–Marseille.
- Bernard Brogliato, examinateur of Ph.D. thesis of C. Beneux (12 July 2018), Université Lorraine.

TROPICAL Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

- Stéphane Gaubert is the coordinator of the Gaspard Monge Program for Optimization, Operations Research and their interactions with data sciences (PGMO), a corporate sponsorhip program, operated by Fondation Mathématique Jacques Hadamard, supported by Criteo, EDF, Orange and Thales, see http://www.fondation-hadamard.fr/fr/pgmo/.

10.1.1.2. Member of the Organizing Committees

- S. Gaubert co-organizes the "Séminaire Parisien d'Optimisation" at Institut Henri Poincaré. https://sites.google.com/site/spoihp/.

10.1.2. Scientific Events Selection

10.1.2.1. Chair of Conference Program Committees

- S. Gaubert, Chair of the PGMO days, EDF Labs Paris Saclay, Nov 20-21, 2018. http://www.fondation-hadamard.fr/fr/pgmo/pgmodays
- S. Gaubert, coorganizer, with A. Daniilidis and S. Tapia, of the workshop "Dynamical Aspects in Variational Analysis", École polytechnique, Dec. 14th, 2018. http://www.cmap.polytechnique.fr/~gaubert/VariationalAnalysisWorkshop/index.html

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
  - Majorization inequalities for valuations of eigenvalues, Mittag-Leffler institute, February 2018.
- X. Allamigeon
  - Log-barrier interior point methods are not strongly polynomial, Workshop on Tropical Algebra and Applications, Mittag-Leffler Institute, Stockholm, Sweden, January 2018
  - Log-barrier interior point methods are not strongly polynomial, Workshop on Algebraic and geometric aspects of semidefinite programming at ISMP, Bordeaux, France, June 2018
  - Performance evaluation of an emergency call center: tropical polynomial systems applied to timed Petri nets, Workshop on Tropical Mathematics & Optimisation for Railways, Birmingham University, UK, June 2018
  - First steps in the formalization of convex polyhedra in Coq, International Conference on Mathematical Software, Notre-Dame University, USA, July 2018

- S. Gaubert
  - Nonarchimedean convex programming and its relation to mean payoff games, invited plenary talk at Highlights of Logic, Automata, and Games, Berlin, September 2018.
  - Condition numbers in nonarchimedean semidefinite programming and their relation with stochastic mean payoff games, Mittag-Leffler institute, February 2018.
  - Inequalities for the spectral radii and spectral norms of nonnegative tensors, ISMP, Bordeaux, Invited session, July 2018.
  - Nonarchimedean Degenerations of Convex Programming – In Which Tropical Geometry Shows That Log-Barrier Interior Point Methods Are Not Strongly Polynomial, Computational and Applied Mathematics Colloquium, The University of Chicago, May 2018.

10.1.5. Leadership within the Scientific Community

- See Section 10.1.1.1 (coordination of PGMO).

10.1.6. Research Administration

- M. Akian :
  - Member of the "comité de liaison SMAI-MODE" since June 2015.
  - Member of the laboratory council of CMAP.
- S. Gaubert :
  - Chairman of the Gaspard Monge Program for Optimization, Operations Research and their interactions with data sciences (PGMO), see 10.1.1.1 for details.
  - Member of the scientific council of CMAP.
- X. Allamigeon:
  - Member of the scientific committee of Inria Saclay – Ile-de-France.
  - Member of the Applied Mathematics Department committee at Ecole Polytechnique.

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 Manuel Ruiz (RTE) et Dominique Quadri (LRI, Université Paris Sud).
  - Co-responsabilité du programme d'approfondissement en mathématiques appliquées (troisième année) à l'École Polytechnique.
- J.B. Eytard
  - Cours de niveau L1-L2 à l'IUT d'Informatique d'Orsay (Univ. Paris-Sud), dans le cadre d'un monitorat (64h) (théorie des graphes, recherche opérationnelle, modélisation mathématique).
- S. Gaubert
  - Course "Systèmes à Événements Discrets", option MAREVA, ENSMP.

  - Course “Algèbre tropicale pour le contrôle optimal et les jeux” of “Contrôle, Optimisation et Calcul des Variations” (COCV) 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 as a book [66].
- M. Skomra
  - TD de mathématiques à l'UPMC.

10.2.2. Supervision

- PhD : Eric Fodjo, registered at École Polytechnique, since October 2013, thesis supervisor: Marianne Akian, defended on Jul 13 2017.
- PhD : Mateusz Skomra, registered at Univ. Paris Saclay since October 2015, thesis supervisor: Stéphane Gaubert, cosupervision: Xavier Allamigeon, defended on Dec. 5, 2018.
- PhD : Jean-Bernard Eytard, registered at Univ. Paris Saclay since October 2015, thesis supervisor: Stéphane Gaubert, cosupervision: Marianne Akian, Mustapha Bouhtou, defended on Nov. 12, 2018.
- PhD in progress: Paulin Jacquot, registered at Univ. Paris Saclay since November 2016, thesis supervisor: Stéphane Gaubert, cosupervision: Nadia Oujdane, Olivier Beaude (EDF).
- PhD in progress: Benoît Tran, registered at Univ Paris-Est Marne La Vallée, since September 2017, thesis supervisor: Jean-Philippe Chancelier (ENPC), cosupervision: Marianne Akian.
- PhD in progress: Maxime Grangereau, registered at Univ. Paris Saclay since Jan 2018, thesis supervisor: Emanuel Gobet, cosupervision: Stéphane Gaubert.
- PhD in progress: Omar Saadi, registered at Univ. Paris Saclay since October 2018, thesis supervisor: Stéphane Gaubert, cosupervision: Marianne Akian.
- PhD in progress: Marin Boyet, registered at Univ. Paris Saclay since October 2018, thesis supervisor: Stéphane Gaubert, cosupervision: Xavier Allamigeon.

10.2.3. Juries

- M. Akian
  - Jury of the 2018 competition for CR2 positions of Inria Saclay–Île-de-France.
  - Jury of the PhD thesis of E. Fodjo (Ecole Polytechnique, thesis supervisor, July 2018).
  - Jury of the PhD thesis of H. Gerard (ENPC, reviewer, Oct. 2018).
  - Jury of the PhD thesis of J.B. Eytard (Ecole Polytechnique, examiner, Nov. 2018).
- X. Allamigeon
  - Comité de suivi doctoral de D. Rouhling (Inria Sophia, Mai 2018)
  - Jury of the PhD thesis of M. Skomra (Ecole Polytechnique, examiner, Dec. 2018).
- S. Gaubert
  - Jury of the HdR of Welington de Oliveira (Sorbonne Universités –Paris I– examiner, Déc. 2018)
  - Jury of the PhD thesis of J.B. Eytard (Ecole Polytechnique, examiner, Nov. 2018).
  - Jury of the PhD thesis of T. Roget (Ecole Polytechnique, examiner, Nov. 2018).
  - Jury of the PhD thesis of M. Skomra (Ecole Polytechnique, examiner, Dec. 2018).

10.3. Conferences, Seminars

- M. Akian
  - The operator approach to entropy games, International workshop on game theory, IHP, June 2018, Paris.

  - Majorization inequalities for valuations of eigenvalues, ANR/DFG PRCI Project Kick-off Meeting, July 2018, Bonn.
  - Tropical geometry, Optimal Control and Mean-payoff Games, Dagstuhl Seminar "Shape Analysis: Euclidean, Discrete and Algebraic Geometric Methods", Oct. 2018, Dagstuhl.
- X. Allamigeon
  - Tropical Linear Optimization, Polytopes à Paris, Paris, France, January 2018.
  - A formalization of convex polyhedra based on the simplex method, Séminaire de Géométrie Algorithmique et Combinatoire, Paris, France, March 2018.
  - Log-barrier interior point methods are not strongly polynomial, Journée de rentrée du CMAP, Palaiseau, France, October 2018.
  - First steps in the formalization of convex polyhedra in Coq, Seminar on Solvers Principles and Architectures, Rennes, France, October 2018.
- M. Boyet
  - The shadow vertex algorithm solves colorful one-versus-all tropical polynomial systems, PGMO Days, Nov. 21, 2018, Palaiseau.
- J.B. Eytard
  - A tropical approach to bilevel programming and a comparison with a competitive equilibrium problem, ROADEF, Feb. 2018, Université Bretagne Sud, Lorient.
  - Tropical geometry applied to bilevel programming and an application to price incentives in telecom networks, JFRO (journées franciliennes de recherche opérationnelle) sur le thème "optimisation bi-niveaux", March 2018, CNAM, Paris.
  - Tropical geometry and discrete convexity applied to bilevel programming, IWOBIP 18, June 2018, Lille.
  - Tropical geometry applied to bilevel programming, ISMP, July 2018, Bordeaux.
  - How to use tropical geometry to solve bilevel programming problems ?, PGMO Days, Nov. 21, 2018, Palaiseau.
- S. Gaubert
  - Tropical spectrahedra and their relation with mean payoff games, University of Illinois at Chicago, May 2018.
  - Tropical spectrahedra and their relation with mean payoff games, International workshop on game theory, IHP, June 2018.
  - A convergent hierarchy of non-linear eigenproblems to compute the joint spectral radius of nonnegative matrices, 23rd International Symposium on Mathematical Theory of Networks and Systems (MTNS), Hong-Kong, Jul. 2018.
- P. Jacquot
  - Fast Computation of Equilibria in Splittable Routing Games: Application to Electricity Demand Response, SMAI Mode, Autrans, March 2018
  - Analysis of a Routing Game Model for Demand Side Management, ISMP, Bordeaux, July 2018.
  - Routing Game on Parallel Networks: the Convergence of Atomic to Nonatomic, CDC, Miami, December 2018
- M. Skomra
  - The condition number of stochastic mean payoff games, ISMP, Bordeaux, July 2018.
  - Condition Numbers of Stochastic Mean Payoff Games and What They Say about Nonarchimedean Semidefinite Programming, 23rd International Symposium on Mathematical Theory of Networks and Systems (MTNS), Hong-Kong, July, 2018.

- A. Sagnier
  - Talk at Ohio State University on «An arithmetic site of Connes-Consani type for $\mathbb{Z}[i]$», January 2018.
  - Talk at Rutgers University on «An arithmetic site of Connes-Consani type for $\mathbb{Z}[i]$», January 2018
  - Talk at Johns Hopkins University on «An arithmetic site of Connes-Consani type for $\mathbb{Z}[i]$», January 2018
  - Short communication at Toposes in Como on «An arithmetic site of Connes-Consani type for $\mathbb{Z}[\sqrt{2}]$», Università degli Studi dell'Insubria, Como, June 2018
  - Short communication at the International Congress of Mathematicians, ICM 2018 on «An arithmetic site of Connes-Consani type for $\mathbb{Z}[i]$» , August 2018
  - Short communication at the Tensors conference on «Tropical tensor products» Polytecnico di Torino, Turin, September 2018.
  - Talk at University of Oslo on «An arithmetic site of Connes-Consani type for for number fields with narrow class number 1», November 2018.
- B. Tran
  - A Stochastic Min-plus Algorithm for Deterministic Optimal Control, ISMP, July 2018, Bordeaux.
- C. Walsh
  - Seminar, Université de Nantes, December 14, 2018. Title of the talk: "The horofunction boundary of Teichmüller space".

BONUS Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

- E-G. Talbi (Conference program chair): Intl. Conf. on Metaheuristics and Nature Inspired Computing (META'2018), Marrakech, Morocco, Oct. 2018.
- N. Melab (Workshop co-chair): Intl. Workshop on the Synergy of Parallel Computing, Optimization and Simulation (HPCS/PaCOS'2018), Orléans, FRANCE, Jul. 16-20, 2018.
- E-G. Talbi (General Chair): 8th Intl. Conf. on Bioinspired Optimization Methods and their Applications (BIOMA'2018), Paris, FRANCE, May 16-18, 2018.
- E-G. Talbi (Workshop co-chair): Intl. Workshop on Optimization and Learning: Challenges and Applications (OLA'2018), Alicante, SPAIN, Feb. 26-28, 2018.
- E-G. Talbi (steering committee): 8th IEEE Workshop Parallel Distributed Computing and Optimization (IPDPS/PDCO'2018), Vancouver, CANADA, May 21-25, 2018.
- N. Melab: Chair of 4 simulation and HPC-related seminars at Université de Lille, Oct-Dec. 2018 (CENAERO-BELGIUM, IBM, UCL-BELGIUM, ONERA).
- B. Derbel and A. Liefooghe (workshop co-chairs): 1st International Workshop on Computational Intelligence for Massive Optimization (CIMO 2018), Nagano, Japan, July 2018 (with H. Aguirre, K. Tanaka and S. Verel).
- B. Derbel (workshop co-chair): Decomposition Techniques in Evolutionary Optimization (DTEO), workshop at GECCO 2018, Kyoto, Japan, July 2018 (with K. Li, X. Li, S. Zapotecas, Q. Zhang and H. Li).
- A. Liefooghe (workshop co-chair): Landscape-aware heuristic search (LAHS), workshop at GECCO 2018, Kyoto, Japan, July 2018 (with N. Veerapen, S. Verel and G. Ochoa).
- B. Derbel (special session co-chair): Advances in Decomposition-based Evolutionary Multi-objective Optimization (ADEMO), special session at WCCI/CEC 2018, Rio, Brazil, July 2018 (with S. Zapotecas and Q. Zhang).
- B. Derbel and A. Liefooghe (special session co-chairs): Multi-/many-objective optimization and learning, special session at BIOMA 2018, Paris, France, May 2018 (with H. Aguirre, B. Filipič, T. Tušar, and S. Verel).

10.1.1.2. Member of the Organizing Committees

- N. Melab and E-G. Talbi: Synergy Summer School on Efficient Multi-objective Optimization, Ljubljana, Slovenia, Aug. 27-31, 2018.
- E-G. Talbi: The first international Metaheuristics Summer School – MESS 2018, Acireale-Sicily, Italy, Jul. 21-25, 2018.

10.1.2. Scientific Events Selection

10.1.2.1. Chair of Conference Program Committees

- N. Melab (Program co-chair): 8th Intl. Conf. on Bioinspired Optimization Methods and their Applications (BIOMA'2018), Paris, France, May 16-18, 2018.

- A. Liefooghe (program co-chair): EvoCOP 2018: 18th European Conference on Evolutionary Computation in Combinatorial Optimisation (Parma, Italy, 2018).
- A. Liefooghe (proceedings chair): GECCO 2018: Genetic and Evolutionary Computation Conference (Kyoto, Japan, 2018).

10.1.2.2. Member of the Conference Program Committees

- IEEE Congress on Evolutionary Computation (CEC), Rio de Janeiro, BRAZIL, Jul. 8-13, 2018.
- The ACM Genetic and Evolutionary Computation Conference (GECCO), Kyoto, JAPAN, July 15-19, 2018.
- The 2018 International Conference on High Performance Computing & Simulation (HPCS), Orleans, FRANCE, July 16–20, 2018.
- IEEE Intl. Workshop on Parallel/Distributed Computing and Optimization (IPDPS/PDCO), Vancouver, Britich Columbia, CANADA, May 21-25, 2018.
- IEEE Intl. on High-Performance Optimization in Industry (HPOI), Ljubljana, SLOVENIA, October 8, 2018.
- Colloque sur l'Optimisation et les Systèmes d'information (COSI), Oran, ALGERIE, Oct. 22-24, 2018.
- The 4^{th} Intl. Conf. on Cloud Computing Technologies and Applications (CloudTech), Brussels, BELGIUM, Nov. 26-28, 2018.
- EvoCOP'2018, 18^{th} European Conference on Evolutionary Computation in Combinatorial Optimization, Parma, ITALY, April 4–6, 2018.
- 15th International Conference on Parallel Problem Solving from Nature (PPSN), Coimbra, Portugal, September 2018
- Genetic and Evolutionary Computation Conference (GECCO), Kyoto, Japan, July 2018.
- IEEE Congress on Evolutionary Computation (WCCI-CEC), Rio, Brazil, July 2018.
- 18th European Conference on Evolutionary Computation in Combinatorial Optimisation (EvoCOP), Parma, Italy, April 2018.

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

- N. Melab: Guest and Managing 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), Vol. 112, 2018.
- P. Korosec, N. Melab and E-G. Talbi. Guest Editor of LNCS Proceedings of 8^{th} Intl. Conf., BIOMA 2018, Paris, France, May 16-18, 2018. *Springer Lecture Notes in Computer Science (LNCS)*, Vol. 10835, 2018.
- B. Derbel: Associate Editor, IEEE Transactions on Systems, Man and Cybernetics: Systems (IEEE).
- A. Liefooghe, M. López-Ibánez: Editors of LNCS Proceedings of the 18th European conference on evolutionary computation in combinatorial optimization (EvoCOP 2018), Lecture Notes in Computer Science (LNCS), vol. 10782, Parma, Italy, 2018.
- E-G. Talbi: Co-editor (with C. Ribeiro) of a special issue in International Transactions on Operational Research (ITOR) on Optimization and Learning, 2018.

10.1.3.2. Reviewer - Reviewing Activities

- Journal of Heuristics (Springer)
- IEEE Transactions on Parallel and Distributed Systems
- IEEE Transactions on Cybernetics
- Evolutionary Computation (MIT)

10.1.4. Invited Talks

- N. Melab: High-performance Computing, Invited Speaker (1h30), Synergy Summer School, Ljubljana, SLOVENIA, Aug. 28th, 2018.
- N. Melab: Introduction to High-performance Computing, Invited Tutorial (1h40), the 7th Intl. Conf. on Metaheuristics and Nature Inspired Computing (META'18), Marrakech, MOROCCO, Oct. 27-31, 2018.
- E-G. Talbi: Bridging the gap between metaheuristics and machine learning, Invited seminar, PUCV Universidad, Santiago, Chile, Mar 2018.
- E-G. Talbi: How machine learning can help metaheuristics, Invited keynote, LOPAL'2018 International Conference on Learning and Optimization Algorithms: Theory and Applications, Rabat, Marrakech, May 2018.
- E-G. Talbi: Synergy between metaheuristics and machine learning, Tutorial, BIOMA'2018 International Conference on Bioinspired Optimization and their Applications, Paris, France, May 2018.
- E-G. Talbi: Parallel and distributed evolutionary algorithms, Invited tutorial, IEEE WCCI World Congress on Computational Intelligence, Rio de Janeiro, Brazil, July 2018.
- E-G. Talbi: Optimization for machine learning, Invited seminar, Universidad Elche, Spain, Dec 2018.

10.1.5. Leadership within the Scientific Community

- N. Melab: scientific leader of Grid'5000 (https://www.grid5000.fr) at Lille, since 2004
- 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
- A. Liefooghe: co-secretary of the association "Artificial Evolution" (EA)

10.1.6. Scientific Expertise

- N. Melab: Reviewer expert for AAPG ANR, CES 23 (B.7, Axe 4), JCJC, FRANCE, 2018
- N. Melab: Member of the advisory committee for the IT and maganement engineer training at Faculté Polytechnique de Mons, BELGIUM

10.1.7. Research Administration

- N. Melab: Member of the steering committee of "Maison de la Simulation" at Université de Lille
- E-G. Talbi, Coordinator of the International Relationships of Inria Lille Nord Europe

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- International Master lecture: N. Melab, Supercomputing, 24h ETD, M2, Université de Lille, FRANCE
- Master lecture: N. Melab, Operations Research, 72h ETD, M1, Université de Lille, FRANCE
- Master leading: N. Melab, Co-head (with B. Merlet) of the international Master 2 of advanced scientific computing, Université de Lille, FRANCE
- Licence: A. Liefooghe, Algorithmic and Data structure, 36h ETD, L2, Université de Lille, FRANCE
- Licence: A. Liefooghe, Algorithmic for Operations Research, 36h ETD, L3, Université de Lille, FRANCE
- Master: A. Liefooghe, Databases, 30h ETD, M1, Université de Lille, FRANCE

- Master: A. Liefooghe, Advanced Object-oriented Programming, 53h ETD, M2, Université de Lille, FRANCE
- Master: A. Liefooghe, Combinatorial Optimization, 10h ETD, M2, Université de Lille, FRANCE
- Master: A. Liefooghe, Multi-criteria Decision Aid and Optimization, 25h ETD, M2, Université de Lille, FRANCE
- Master leading: A. Liefooghe, superviser of the Master 2 MIAGE IPI-NT
- Master: Bilel Derbel, Combinatorial Optimization, 35h, M2, Université de Lille, FRANCE
- Master: Bilel Derbel, Grid Computing, 16h, M2, Université de Lille, FRANCE
- Master: Bilel Derbel, Parallel and Distributed Programming, 35h, M1, Université de Lille, FRANCE
- Master: Bilel Derbel, Algorithms and Applications, 28h, M1, Université de Lille, FRANCE
- Engineering school: El-Ghazali Talbi, Advanced optimization, 36h, Polytech'Lille, Université de Lille, FRANCE
- Engineering school: El-Ghazali Talbi, Data mining, 36h, Polytech'Lille, Université de Lille, FRANCE
- Engineering school: El-Ghazali Talbi, Operations research, 60h, Polytech'Lille, Université de Lille, FRANCE
- Engineering school: El-Ghazali Talbi, Graphs, 25h, Polytech'Lille, Université de Lille, FRANCE
- Master leading: B. Derbel, head of the Master MIAGE, Université de Lille, FRANCE
- Licence: O. Abdelkafi, Computer Science, 46.5 ETD, L1, Université de Lille, FRANCE
- Licence: O. Abdelkafi, Web Technologies, 36 ETD, L1, Université de Lille, FRANCE
- Licence: O. Abdelkafi, Unix system introduction, 6 ETD, L2, Université de Lille, FRANCE
- Licence: O. Abdelkafi, Web Technologies, 24 ETD, L2 S3H, Université de Lille, FRANCE
- Licence: O. Abdelkafi, object-oriented programming, 36 ETD, L2, Université de Lille, FRANCE
- Licence: O. Abdelkafi, Relational Databases, 36h ETD, L3, Université de Lille, FRANCE
- Licence: O. Abdelkafi, Algorithmic for Operations Research, 36h ETD, L3, Université de Lille, FRANCE

10.2.2. Supervision

- PhD defended: Sohrab Faramarzi, Optimization of medical laboratories, Defended on Dec. 17th, El-Ghazali Talbi
- PhD in progress: Z. Garroussi, Demand side management in smart grids: Multi-objective models, El-Ghazali Talbi and Rachid Ellaia (EMI, Morocco)
- PhD in progress: J. Pelamatti, Multi-disciplinary design of aerospace vehicles, Jan 2017, El-Ghazali Talbi
- PhD in progress: Ali Hebbal, Surrogate-assisted multi-objective evolutionary algorithms, Oct 2017, El-Ghazali Talbi and Nouredine Melab
- PhD in progress (cotutelle): Maxime Gobert, Surrogate-assisted multi-objective evolutionary algorithms, Oct 2017, Nouredine Melab (Université de Lille) and Daniel Tuyttens (Université de Mons, BELGIUM)
- PhD in progress (cotutelle): Guillaume Briffoteaux, Surrogate-assisted multi-objective evolutionary algorithms, Oct 2017, Nouredine Melab (Université de Lille) and Daniel Tuyttens (Université de Mons, BELGIUM)
- PhD in progress: Geoffrey Pruvost, Machine learning and decomposition techniques for large-scale multi-objective optimization, Oct 2018, Bilel Derbel and Arnaud Liefooghe

- PhD in progress: Nicolas Berveglieri, Meta-models and machine learning for massive expensive optimization, Oct 2018, Bilel Derbel and Arnaud Liefooghe
- PhD in progress: Alexandre Jesus, Algorithm selection in multi-objective optimization, Bilel Derbel and Arnaud Liefooghe (University of Lille), Luís Paquete (University of Coimbra, PORTUGAL)

10.2.3. Juries

- N. Melab: PhD thesis of Yahya Al Dhuraibi, Flexible Framework for Elasticity in Cloud Computing, Université de Lille (FRANCE), Dec. 10^{th} 2018.
- N. Melab: PhD thesis of Muhammad Umer Wasim, Design and Implementation of Legal Protection for Trade Secrets in Cloud Brokerage Architectures relying on Blockchains, University of Bologna (ITALY), Apr. 2018.
- N. Melab: PhD thesis of Maruf Ahmed, On Improving The Performance and Resource Utilization of Consolidated Virtual Machines: Measurement, Modeling, Analysis and Prediction, The University of Sydney (AUSTRALIA), Aug. 2018.
- B. Derbel: PhD thesis of Christopher Jankee, Optimisation par métaheuristique adaptative distribuée en environnement de calcul parallèle, Université du Littoral Côte d'Opale (FRANCE), Aug. 2018.

10.3. Popularization

10.3.1. Internal or external Inria responsibilities

- N. Melab: Nominated again as Chargé de Mission of High Performance Computing and Simulation at Université de Lille, since 2010.
- E-G. Talbi: International relations coordinator for Inria Lille Nord Europe, since 2016.
- N. Melab. Member of the Working Group on software and technological demonstrators, since end 2017.

GEOSTAT Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Selection

10.1.1.1. Chair of Conference Program Committees

- K. Daoudi is Special Session Chair for the The 9th International Symposium on Signal, Image, Video and Communications ISIVC 2018, link.
- H. Yahia is Publication Chair for the The 9th International Symposium on Signal, Image, Video and Communications ISIVC 2018, link.

10.1.2. Journal

10.1.2.1. Member of the Editorial Boards

- H. Yahia is Review Editor for the journal Fronteirs in Physiology (Fractal Physiology).
- H. Yahia is Guest Editor of Springer Nature, Special Issue on Marine Information Technology, Volume 19, Issue 8, August 2018.

10.1.3. Invited Talks

- Seminars: K. Daoudi gave a seminar in July 2018 at FORTH in Greece. Title: "Speech-based differential diagnosis of Parkinsonism".

10.1.4. Scientific Expertise

- H. Yahia has been expert for the CNRS Momentum call.

10.2. Popularization

- C. Sakka, A. Zebadua, N. Brodu and H. Yahia have been participating in the demonstration made by I2s company during the Celebration of the 10 years of the center and presenting results of the demosaicing method applied to digital images.

10.2.1. Interventions

- GEOSTAT has been participating to the 10 years Inria celebration, in the form of a demonstration with I2S company.

INOCS Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

- IWOBIP 2018, 2nd International Workshop on Bilevel Programming, Lille, France, June 2018: Luce Brotcorne, Martine Labbé.
- Operations Research 2018, Brussels, Belgium, September 2018: Bernard Fortz.

10.1.1.2. Member of the Organizing Committees

7th Winter School on Network Optimization, Estoril, Portugal, January 2018: Bernard Fortz.

International Symposium on Mathematical Programming (ISMP), Bordeaux, July 2018: Luce Brotcorne, Bernard Fortz.

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

ORBEL 2018, Liège, Belgium, January 2018: Bernard Fortz

6th INFORMS Transportation Science and Logistics Society Workshop, January, 2018: Luce Brotcorne, Frédéric Semet

ROADEF2018 - 18ème Conférence de la Société Française de Recherche Opérationnelle et d'Aide à la Décision, Metz, France, February 2018: Luce Brotcorne, Bernard Fortz, Frédéric Semet

ISCO 2018: International Symposium on Combinatorial Optimization, Marrakesh, Morocco, April, 2018: Martine Labbé

Odysseus 2018, International Workshop on Freight Transportation, Cagliari, Italy, June 2018: Martine Labbé, Frédéric Semet

Matheuristics 2018, Tours, France, June 2018: Martine Labbé

EURO/ALIO International Conference 2018 on Applied Combinatorial Optimization, Bologna, June 2018: Martine Labbé

International Symposium on Mathematical Programming (ISMP), Bordeaux, July 2018: Martine Labbé (Program Committee), Frédéric Semet (Scientific Committee)

EURO 2018, European Conference of Operational Research Societies, Valencia, Spain, July 2018: Luce Brotcorne, Bernard Fortz

INFORMS Annual Meeting, Phoenix, United States, November 2018: Luce Brotcorne (cluster chair), Bernard Fortz

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

EURO Journal on Computational Optimization: Martine Labbé - Editor in chief, Bernard Fortz - Editor.

Computers and Operations Research: Luce Brotcorne - Associate editor.

INFORMS Journal on Computing: Bernard Fortz - Associate editor.

International Transactions in Operations Research: Bernard Fortz, Martine Labbé - Associate editors.

Transportation Science: Martine Labbé - Member of the Advisory Board.

10.1.3.2. Reviewer - Reviewing Activities

Annals of Operations Research, Applied Computing and Informatics, Central European Journal of Operations Research, Computers & Operations Research, Computational Optimization and Applications, Discrete Applied Mathematics, EURO Journal on Transportation and Logistics, European Journal of Operational Research, IISE Transactions, INFORMS Journal on Computing, International Journal of Management Science and Engineering Management, Mathematical Programming Computation, Networks, Omega, Operations Research, Optimization and Engineering, RAIRO - Operations Research, Transportation Science: Luce Brotcorne, Diego Cattaruzza, Bernard Fortz, Martine Labbé, Maxime Ogier, Frédéric Semet.

10.1.4. Invited Talks

XIX Latin-Iberoamerican Conference on Operations Research (CLAIO 2018), Lima, Peru, September 2018: Luce Brotcorne, EURO Plenary speaker [28].

Journées de l'optimisation, Montreal, Canada, May 2018 : Martine Labbé, Plenary Speaker [31].

10.1.5. Leadership within the Scientific Community

EURO Working Group "Pricing and Revenue Management": Luce Brotcorne - coordinator.

EURO Working Group "European Network Optimization Group (ENOG)": Bernard Fortz - coordinator.

EURO Working Group "Vehicle routing and logistics optimization (VEROLOG)": Frédéric Semet - Member of the board.

INFORMS Women in OR/MS : Luce Brotcorne - International liaison.

SIAG/Optimization Prize committee: Martine Labbé - Chair.

ORBEL (Belgian Operations Research Society): Bernard Fortz - Member of the board of administration and treasurer.

ORBEL representative for EURO and IFORS: Bernard Fortz.

CNRS GdR 3002: Operations Research: Frédéric Semet - Member of the steering committee.

10.1.6. Scientific Expertise

Scientific orientation committee of the Interuniversity Centre on Entreprise Networks, Transportation and Logistics (CIRRELT), Canada: Bernard Fortz, Frédéric Semet - Members.

Centro de Matemática, Aplicaçoes Fundamentais e Investigaçao Operacional, University of Lisbon: Martine Labbé - Member.

DFG Review Panel "Mathematics" for Clusters of Excellence, 2018: Martine Labbé - Member.

Scientific committee of France-Netherlands Exchange Program: Luce Brotcorne - Member.

Evaluation committee for Inria/MITACS Exchange Program: Luce Brotcorne - Member.

Evaluation committee COST GTRI: Luce Brotcorne - Member.

President of the FRIA PE1 - jury 1: Bernard Fortz - Chair.

Scientific board of PICOM competitiveness cluster: Frédéric Semet - Member.

Agence Nationale de la Recherche (ANR): Luce Brotcorne, Frédéric Semet - Reviewer.

Fond de Recherche Nature et Technologie du Québec: Frédéric Semet - Reviewer.

Research Council of Norway: Frederic Semet - Reviewer.

10.1.7. Research Administration

Committee for the Technological Development (CDT): Luce Brotcorne - Member.

CRIStAL: Frédéric Semet - Deputy-director.

Scientific council of Centrale Lille: Frédéric Semet - Elected member.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Master: Bernard Fortz, Recherche Opérationnelle et Applications, 30hrs, M1, Université de Mons (campus Charleroi), Belgique.

Master: Bernard Fortz, Continuous Optimization, 24hrs, M1 & M2, Université libre de Bruxelles, Belgique.

Master: Martine Labbé, Computer science seminar, 12hrs, M2, Université libre de Bruxelles, Belgique.

Master: Frédéric Semet, Non-linear Optimization, 30hrs, M2, Centrale Lille.

Master: Frédéric Semet, Operations Research, 28hrs, M2, Centrale Lille.

Master: Luce Brotcorne, Optimisation, 14hrs, M1, Polytech Lille.

Master: Luce Brotcorne, Recherche opétrationnelle, 16hrs, M1 apprentissage, Polytech Lille.

Master: Luce Brotcorne, Diego Cattaruzza, Maxime Ogier, Frédéric Semet, Numerical Analysis and Optimization, 132hrs, M1, Centrale Lille.

Master: Diego Cattaruzza, Maxime Ogier, Object-Oriented Programming, 48hrs, M1, Centrale Lille.

Master: Diego Cattaruzza, Maxime Ogier, Operations Research, 16hrs, M1, Centrale Lille.

Master: Frédéric Semet, Large-scale optimization methods, 24hrs, M1, Centrale Lille.

Licence: Diego Cattaruzza, Maxime Ogier, Object-Oriented Programming, 36hrs, L3, Centrale Lille.

Licence: Frédéric Semet, Advanced programming and Complexity, 24hrs, L3, Centrale Lille.

Licence: Diego Cattaruzza, Maxime Ogier, Object-Oriented Programming, 40hrs, L2, Centrale Lille.

Licence: Diego Cattaruzza, Web Technologies and Multimedia, 32hrs, L2, Centrale Lille.

Licence: Bernard Fortz, Algorithmique 1, 12hrs, L1, Université libre de Bruxelles, Belgique.

Licence: Bernard Fortz, Algorithmique 2, 24hrs, L2, Université libre de Bruxelles, Belgique.

Licence: Bernard Fortz, Algorithmique et Recherche Opérationnelle, 24hrs, L3, Université libre de Bruxelles, Belgique.

Licence: Martine Labbé, Projets d'informatique 3 transdisciplinaire, 12hrs, L3, Université libre de Bruxelles, Belgique.

10.2.2. Supervision

PhD: Luciano Porretta, Models and methods for the study of genetic associations, Université libre de Bruxelles, January 2018, Bernard Fortz.

PhD in progress: Jérôme De Boeck, Optimization problems in energy, from October 2015, Bernard Fortz.

PhD in progress: Mathieu Besançon, Approche bi-niveau de réponse à la demande dans les réseaux électriques intelligents, from September 2018, Miguel Anjos, Luce Brotcorne, Frédéric Semet.

PhD in progress: Yaheng Cui, Models and methods for decentralized decision in logistics networks, from Oct 2016, Luce Brotcorne, Eric Ballot.

PhD in progress: Concepción Domínguez Sánchez, Mixed integer linear models and algorithms for pricing problems, from October 2017, Martine Labbé.

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 Niederhausern, Design and pricing of new services in energy in a competitive environment, from Oct 2015, Luce Brotcorne, Didier Aussel.

PhD in progress: Fränk Plein, Models and methods for the robust verification of booked capacities in gas networks in a decentralized setting, from October 2017, Martine Labbé.

PhD in progress: Luis Alberto Salazar Zendeja, Formulations and resolution methods for network interdiction problems, from November 2018, Diego Cattaruzza, Martine Labbé, Frédéric Semet.

PhD in progress: Yuan Yuan, Vehicle routing problems with synchronization for city logistics, from Oct 2016, Diego Cattaruzza, Frédéric Semet.

10.2.3. Juries

PhD: "Design of reliable aerospace system architecture", University of Edinburgh. Lukas Matthias Schaefer, Bernard Fortz - Reviewer.

PhD: "Fast and scalable optimization for segment routing", Université catholique de Louvain. Renaud Hartert, Bernard Fortz - Examiner.

PhD: "Network design under uncertainty and demand elasticity", Concordia University. Carlos Armando Zetina, Bernard Fortz - External examiner.

Habilitation: "Optimization for complex problems in air and rail transport", Université de Lille 1. Paola Pellegrini, Bernard Fortz - Reviewer.

Habilitation: "A journey through optimization: from global to discrete optimization and back", Université de Lorraine. Bernardetta Addis, Bernard Fortz - Reviewer, Martine labbé - Examiner.

PhD: "Design of optimal routes for vehicles and drivers", Universidad de La Laguna. Bencomo Domínguez-Martín, Martine Labbé - Reviewer.

PhD: "A comparative study of labeling algorithms within the branch-and-price framework for vehicle routing with time windows", Université de Liège. Stefano Michelini, Martine Labbé - Examiner.

PhD: "Mathematical programming models and algorithms for offshore wind park design", Technical University of Denmark. Martina Fischetti, Martine Labbé - External examiner.

Habilitation: "Linear formulations and exact algorithms for combinatorial optimization", Sorbonne Université. Pierre Fouilhoux, Martine Labbé - Examiner.

PhD: "Tactical planning on freight transport networks: service design and pricing", Université de Liège. Christine Tawfik, Luce Brotcorne - Reviewer.

PhD: "A tropical geometry and discrete convexity approach to bilevel programming", Université de Paris-Saclay. Jean-Bernard Eytard, Luce Brotcorne - Reviewer.

PhD: "Revenue management for transport service provides in physical internet: Freight carriers as case", Université de Recherche Paris Sciences et Lettres. Bin Qiao, Luce Brotcorne - Reviewer.

10.3. Popularization

F. Semet, Club Logistique et Transport, CCI St Quentin, November 2018.

MISTIS Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

- Florence Forbes, Stéphane Girard and Julyan Arbel organized the two-day workshop Bayesian learning theory for complex data modelling, on September 6-7 2018.

10.1.1.2. Member of the Organizing Committees

- Florence Forbes was a member of the scientific committee of the 50th journées de statistique of Société Francaise de Statistique (JDS 2018) organized in Saclay.
- Julyan Arbel co-organized the two-day workshop entitled Workshop sur la dynamique des communautés sur Twitter en période électorale : analyse par graphes aléatoires workshop on random graphs in Grenoble on April 26-27 2018.
- Julyan Arbel co-organized with Richard Nickl, Cambridge University, a session entitled Bayesian nonparametrics for stochastic processes at International Society for Bayesian Analysis (ISBA) World Meeting 2018 in Edinburgh.
- Jean-Baptiste Durand co-organized a three-day workshop on Models and Analysis of Eye Movements in Grenoble on June 6-8 2018 (https://eyemovements.sciencesconf.org/).

Seminars organization

- MISTIS participates in the weekly statistical seminar of Grenoble. Several lecturers have been invited in this context.
- Florence Forbes, Julyan Arbel and Marta Crispino are co-organizing a monthly reading group on Bayesian statistics.

10.1.2. Scientific Events Selection

10.1.2.1. Reviewer

In 2018, Florence Forbes, Stéphane Girard and Julyan Arbel have been a reviewer for *Journées de la Statistique* (JDS 2018). Additionally,

- In 2018, Julyan Arbel has been a reviewer for
  - Statistics Conferences: *Bayesian Young Statisticians Meeting proceedings* (BAYSM),
  - Machine Learning Conferences: *Conference on Neural Information Processing Systems* (NIPS), *International Conference on Learning Representations* (ICLR), *Symposium on Advances in Approximate Bayesian Inference* (AABI).

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 is also member of the Advisory Board of the *Dependence Modelling* journal since December 2014.
- Florence Forbes is Associate Editor of the journal Frontiers in ICT: Computer Image Analysis since its creation in Sept. 2014. She is also Associate Editor of the *Computational Statistics and Data Analysis* journal since May 2018.
- Julyan Arbel is Associate Editor of the *Bayesian Analysis* (BA) journal.

10.1.3.2. Reviewer - Reviewing Activities

- In 2018, Florence Forbes has been a reviewer for *Ecological Modelling* journal.
- In 2018, Stéphane Girard has been a reviewer for *Annals of the Institute of Statistical Mathematics, Statistics & Risk Modeling, Communications in Statistics - Theory and Methods, Extremes.*
- In 2018, Jean-Baptiste Durand has been a reviewer for *Behavior Research Methods* (BRM) and a guest editor for *PLOS Computational Biology* (PLOS Comput. Biol.).
- In 2018, Julyan Arbel has been a reviewer for: *Annals of Statistics* (AoS), *Bayesian Analysis* (BA), *Brazilian Journal of Probability and Statistics* (BJPS), *Computational Statistics & Data Analysis* (CSDA), *Electronic Journal of Statistics* (EJS), *Journal of Nonparametric Statistics* (JNS), *Scandinavian Journal of Statistics* (SJS), *Statistics and Probability Letters* (SPL).

10.1.4. Invited Talks

Florence Forbes has been invited to give talks at the following seminars and conferences:

- Data Science Seminar Series, December 2018 (Link) .
- 11th International Conference of Computational and Methodological Statistics (CMStat), University of Pisa, Italy, December 14-16, [60].
- NeuroCog Seminar Series, October 2018.
- La Trobe-Kyushu Joint Seminar on Mathematics for Industry, Melbourne, October 2018 (Link).
- Joint Statistical Meeting of the American Statistical Association, Vancouver Canada, July [29]
- Workshop on Bayesian nonparametrics, Bordeaux, France, July 2-4, [30]

Julyan Arbel has been invited to give talks at the following seminars and conferences:

- 11th International Conference of Computational and Methodological Statistics (CMStat), University of Pisa, Italy, December 14-16. Invited talk: Some distributional properties of Bayesian neural networks.
- Workshop on Bayesian nonparametrics, Bordeaux, France, July 2-4. Invited talk. Some distributional properties of Bayesian neural networks.
- Olympiades Académiques de Mathématiques, Grenoble. Talk: The mathematics of artificial intelligence.
- Trinity College Statistics Seminar, Dublin, Ireland, May 9. Invited talk: Bayesian graphs and neural networks.
- Journées statistiques de Rochebrune, Megève, France (26-30 March). Invited course: An introduction to Bayesian nonparametric statistics.
- R User group in Grenoble, France, February 8, 2018. Talk (with Alexis Arnaud): Good coding practice, coding style and R packages.
- Workshop on Statistical Methods for Post Genomic Data (SMPGD), Université de Montpellier, France, 11-12 January 2018. Invited talk: A Bayesian Nonparametric Approach to Ecological Risk Assessment.

Among the conferences listed in Section 10, [42], [43], [31], [33] were invited talks.

10.1.5. Scientific Expertise

Florence Forbes is Scientific Advisor since March 2015 for the Pixyl company.

10.1.6. Research Administration

- S. Girard is a member of the "Comité des Emplois Scientifiques" at Inria Grenoble Rhône-Alpes 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.
- S. Girard has been a reviewer of research projects for the Research Foundation Flanders (FWO), Belgium.
- Florence Forbes is a member of the "Comité Développement Technologique" for software development projects at Inria Grenoble Rhône-Alpes since 2015.
- Florence Forbes is a member of the "Comite d'organisation stratégique" of Inria Grenoble Rhône-Alpes since 2017.
- Florence Forbes is a member of the Executive Committee of the Grenoble data institute.
- Florence Forbes has been a member of the Selection committee for assistant professors at ENS Paris and a member of the Inria admission committee of junior researchers (CRCN) in June 2018.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- Master : Stéphane Girard, *Statistique Inférentielle Avancée*, 18 ETD, M1 level, Ensimag. Grenoble-INP, France.
- Master : Stéphane Girard, *Data analysis, linear models and ANOVA*, 18 ETD, M1 level, MSIAM. UGA, France.
- Master and PhD course: Julyan Arbel, Bayesian statistics, Ensimag, Université Grenoble Alpes (UGA), 25 ETD.
- Master and PhD course: Julyan Arbel, Bayesian nonparametric statistics, Master Mathématiques Apprentissage et Sciences Humaines (M*A*S*H), Université Paris-Dauphine, 25 ETD.
- Master: Jean-Baptiste Durand, *Statistics and probability*, 192H, M1 and M2 levels, Ensimag Grenoble INP, France. Head of the MSIAM M2 program, in charge of the data science track.
- Jean-Baptiste Durand is a faculty member at Ensimag, Grenoble INP.

10.2.2. Supervision

- PhD defended: Clément Albert "Estimation des limites d'extrapolation par les lois de valeurs extrêmes. Application à des données environnementales", December 2018, Stéphane Girard, Université Grenoble Alpes.
- PhD defended: Thibaud Rahier "Réseaux Bayesiens pour la fusion de données statiques et temporelles", December 2018, Florence Forbes and Stéphane Girard, Université Grenoble Alpes.
- PhD defended: Pierre-Antoine Rodesch "Méthodes statistiques de reconstruction tomographique spectrale pour des systèmes à détection spectrométrique de rayons X", October 9, 2018, Florence Forbes, Université Grenoble Alpes.
- PhD defended: Alexis Arnaud "Analyse statistique d'IRM quantitatives par modèles de mélange : Application à la localisation et la caractérisation de tumeurs cérébrales", October 24, 2018, Florence Forbes and E. Barbier, Université Grenoble Alpes.

- PhD in progress: Karina Ashurbekova, "Robust Graphical Models" Florence Forbes and Sophie Achard, Université Grenoble Alpes, started on October 2016.
- PhD in progress: Veronica Munoz,"Extraction de signatures dans les données IRM de patients parkinsoniens de novo", Florence Forbes and Michel Dojat, Université Grenoble Alpes, started on October 2017.
- PhD in progress: Fabien Boux,"Développement de méthodes statistiques pour l'imagerie IRM fingerprinting", Florence Forbes and Emmanuel Barbier, Université Grenoble Alpes, started on October 2017.
- PhD in progress: Benoit Kugler, "Massive hyperspectral images analysis by inverse regression of physical models", Florence Forbes and Sylvain Douté, Université Grenoble Alpes, started on October 2018.
- PhD in progress: Chun-Chen Tu,"Gaussian mixture sub-clustering/reduction refinement of Non-linear high-to-low dimensional mapping", Florence Forbes and Naisyin Wang, University of Michigan, Ann Arbor.
- PhD in progress: Mariia Vladimirova, "Prior specification for Bayesian deep learning models and regularization implications", started on October 2018, Julyan Arbel and Jakob Verbeek.
- PhD in progress: Brice Olivier, "Joint analysis of eye-movements and EEGs using coupled hidden Markov and topic models", started on October 2015, Jean-Baptiste Durand and Anne Guérin-Dugué (Université Grenoble Alpes).
- PhD in progress: Aboubacrène Ag Ahmad "*A new location-scale model for heavy-tailed distributions*", started on September 2016, Séphane Girard and Alio Diop (Université Gaston Berger, Sénégal).
- PhD in progress: Meryem Bousebata "*Bayesian estimation of extreme risk measures: Implication for the insurance of natural disasters*", started on October 2018, Séphane Girard and Geffroy Enjolras (Université Grenoble Alpes).
- PhD in progress: Alexandre Constantin "*Analyse de séries temporelles massives d'images satellitaires: Applications à la cartographie des écosystèmes*", started on November 2018, Séphane Girard and Mathieu Fauvel (Université Grenoble Alpes).

10.2.3. Juries

- Julyan Arbel has been reviewer for the PhD thesis of Ilaria Bianchini "Modeling and computational aspects of dependent completely random measures in Bayesian nonparametric statistics", Politecnico di Milano, Italy.
- Stéphane Girard has been reviewer for the PhD thesis of Mor Absa Loum, "*Modèle de mélange et modèles linéaires généralisés, application aux données de co-infection*", Univ. Paris-Saclay, France, et Gaston Berger, Sénégal.
- Stéphane Girard has been a member of the PhD committee of Antoine Usseglio Carleve, "*Estimation de mesures de risque pour les distributions elliptiques conditionnées*", Univ. Lyon, France.
- Florence Forbes has been reviewer for the PhD thesis of Amy Chan, University of Queensland, Brisbane and for the HDR thesis of Emilie Lebarbier, agroParisTech.
- Florence Forbes has been a member of the PhD committee of Israel Gebru Inria Grenoble, Marine Roux Gipsa-Lab, Grenoble and Jessica Sodjo, Bordeaux University.

10.3. Popularization

Florence Forbes was a speaker at the Paris Biotech Sante Forum on AI in life sciences, in November 2018, (Program).

10.3.1. Articles and contents

S. Girard and C. Albert have given an interview "When statistics help to predict disasters" for Citizen press: https://www.inria.fr/en/centre/grenoble/news/statistics-and-disasters

MODAL Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

Pascal Germain and Benjamin Guedj are the organizers of the https://modal.lille.inria.fr/wikimodal/doku.php?id=seminarsModal team scientific seminar.
Sophie Dabo-Niang is a co-organizer of the 2nd Conference on Econometrics for Environment.
Sophie Dabo-Niang, Cristian Preda and Vincent Vandewalle are the organizers of a session on "Functional Data Analysis" for the conference COMPSTAT 2018.
Vincent Vandewalle is the organizer of a session on advances in model based clustering for the conference ERCIM 2018.

10.1.2. Scientific Events Selection

10.1.2.1. Chair of Conference Program Committees

Sophie Dabo-Niang is the chair of the Scientific Committee of CIMOM18.

10.1.2.2. Member of the Conference Program Committees

Christophe Biernacki is a member of the program committee of MBC2, an international workshop on Model-Based Clustering and Classification (http://mbc2.unict.it).

Cristian Preda was a member of the Scientific Committee of the 9th International Workshop on Applied Probability, IWAP 2018, 18-21 June Budapest, Hungary (https://iwap2018.com).

10.1.2.3. Reviewer

Pascal Germain acted as a reviewer for NIPS 2018, ICML 2018, ICLR 2018, CAp 2018.
Benjamin Guedj served as a reviewer for the top-tier conferences in machine learning ALT 2018, AISTATS 2018, NIPS 2018, ICML 2018, ICLR 2018. He also served as a reviewer for journals (Electronic Journal of Statistics, Journal of Machine Learning Research).
Sophie Dabo-Niang acted as a reviewer for JNP, JSPI, JRSSB, Spatial Statistics, Journal of SFDS, JMVA, ...
Christophe Biernacki acted as a reviewer for a dozen international statistical journals (CSDA, STCO, JMLR, IEEE PAMI, ...).
Serge Iovleff acted as a reviewer for Journal of Statistics and Computing.
Vincent Vandewalle acted as a reviewer for Statistics in Medicine, ADAC and Journal de la SFdS.
Alain Celisse acted as a reviewer for the Annals of Statistics, Bernoulli, JMLR, EJS, JSPI, Artificial Intelligence, ...
Cristian Preda acted as a reviewer for TEST, MCAP, JASA and Bernoulli.

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

Christophe Biernacki is an Associate Editor of the North-Western European Journal of Mathematics (NWEJM) and for Frontiers on the topic "Computational Methods for Data Analytics". He is also a Guest Editor for the Special Issue on Innovations in Model-Based Clustering and Classification of the journal Advances Data Analysis and Classification (ADAC).

Cristian Preda is an Associate editor of the Methodology and Computing in Applied Probability Journal.

10.1.4. Invited Talks

Christophe Biernacki gave several invited talks:

- One talk at the international conference Compstat 2018
- Four talks at the Summer School on Clustering, Data Analysis and Visualization of Complex Data, May 2018, Catania, Italy [21] [22] [23] [30]
- Two talks at the Research Summer School on Statistics for Data Science – S4D, June 15th-22th 2018, Caen, France [32] [31]
- One talk at the international conference ERCIM 2018 [33]

Vincent Vandewalle:

- Invited talk at the international conference Compstat 2018 [25]
- Invited talk at the international conference ERCIM 2018
- Seminar of the EA 2694 (Université de Lille), Lille, France

Alain Celisse:

- ERCIM, Pise, 15 December 2018
- IWAP, Budapest, July 2018
- WeierstraßInstitute, Berlin, 2018

Pascal Germain:

- Journée Lilloise de Probabilité et Statistiques, Lille, France, 22 June, 2018
- Séminaire de l'équipe PS, Laboratoire Painlevé (University of Lille), Villeneuve d'Ascq France, 9 May, 2018

Benjamin Guedj:

- December 2018, GreekStochastics κ , Athens, Greece
- December 2018, 11th International Conference of the ERCIM working group on Computational and Methodological Statistics (CMStatistics 2018) (invited talk), Pisa, Italy
- September 2018, 2nd Italian-French Statistics Seminar (invited talk), Grenoble, France
- June 2018, 2nd annual congress of the French Mathematical Society (invited talk), Lille, France

Cristian Preda:

- One-Dimensional Discrete Scan Statistics Associated to Some Dependent Models, 5th Stochastic Modeling Techniques and Data Analysis International Conference. 12 - 16 June 2018, Chania, Crete, Greece

10.1.5. Leadership within the Scientific Community

Sophie Dabo-Niang is vice-chair of EMS-CDC.

Till May 2018, Christophe Biernacki was the president of the data mining and learning group of the French statistical association (SFdS, http://www.sfds.asso.fr/).

Since May 2018, Benjamin Guedj has served as president of the Machine Learning and Artificial Intelligence group (MALIA) of the French Statistical association (SFdS, http://www.sfds.asso.fr/).

Since 2017, Benjamin Guedj has been serving as a member of the boards of SFdS and AMIES.

10.1.6. Scientific Expertise

Guillemette Marot reviewed one project as an expert for the ANR and another one for ANSES.

10.1.7. Research Administration

Sophie Dabo-Niang is in charge of the MeQAME axis of the laboratory LEM, CNRS 9221.

Christophe Biernacki has been “Délégué Scientifique” of the Inria Lille center since June 2017.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Sophie Dabo-Niang is teaching

- Master: Spatial Statistics, 24h, M2, University of Lille, France
- Master: Advanced Statistics, 24h, M2, University of Lille, France
- Master: Multivaraite Data Analyses, 24h, M2, University of Lille, France
- Licence: Probability, 24h, L2, University of Lille, France
- Licence: Multivariate Statistics, 24h, L3, University of Lille, France

Guillemette Marot is teaching:

- Licence: Biostatistics, 12h, L1, University of Lille Droit et Santé, France
- Licence: Health care Informatics, 24h, L2, University of Lille Droit et Santé, France
- Master: Biostatistics, 45h, M1, University of Lille Droit et Santé, France
- Master: Supervised classification, 20h, M1, Polytech Lille, France
- Doctorat: Data analysis with R, 7h, University of Lille Droit et Santé, France
- Doctorat: RNA-Seq analysis, 12h, University of Lille Droit et Santé, France

Serge Iovleff is teaching

- Licence: Mathématiques discrètes, 68h, University of Lille, DUT Informatique
- Licence: Modélisation mathématique, 14h, University of Lille, DUT Informatique
- Licence: Algèbre linéaire, 32h, University of Lille, DUT Informatique
- Licence: Analyse et méthodes numériques, 56h, University of Lille, DUT Informatique
- Licence: R.O. et aide à la décision, 32h, University of Lille, DUT Informatique
- Formation Continue: Modélisation, 10h, University of Lille, DUT Informatique
- Master: Introduction to statistics, 16h, University of Lille

Cristian Preda is teaching

- Licence: Linear Regression, 24h, L3, University of Lille, France
- Master: Advanced Statistics, 24h, M1, University of Lille, France
- Master: Biostatistics, 10h, M2, University of Lille, France
- Master: Experimental Designs, 24h, M2, University of Lille, France

Alain Celisse is teaching

- Licence: Graphes et langages, 24h, L3, University of Lille, France
- Licence: Probabilités et statistique, 136h, L3, University of Lille, France
- Formation continue: Probabilités et statistique, 32h, L3, University of Lille, France

Pascal Germain is teaching

- Master: Introduction aux réseaux de neurones, 30h, M2, University of Lille, France

Benjamin Guedj is teaching

- Master: Bayesian Learning, 10h, M2, Centrale Lille, France

10.2.2. Supervision

PhD in progress: Yaroslav Averyanov, November 2017, supervision: Alain Celisse.

PhD in progress: Anne-Lise Bedenel, June 2015, supervision: Christophe Biernacki, Laetitia Jourdan.

PhD in progress: Adrien Ehrhardt, June 2016, supervision: Christophe Biernacki, Philippe Heinrich and Vincent Vandewalle.

PhD defended: Le Li, November 2014–November 2018, supervision: Benjamin Guedj.

PhD in progress: Arthur Leroy, November 2017, supervision: Benjamin Guedj.

PhD in progress: Margot Selosse, October 2017, Christophe Biernacki and Julien Jacques.

PhD in progress: Maxime Baelde, January 2016, Christophe Biernacki and Raphaël Greff.

PhD in progress: Hélène Sarter, Outils statistiques pour la sélection de variables et l'intégration de données “cliniques" et "omiques” : développement et application au registre EPIMAD, December 2016, Corinne Gower and Guillemette Marot.

10.2.3. Juries

Pascal Germain was an examiner at the PhD defense of Valentina Zantedeschi, University Jean Monnet of Saint-Etienne, December 18, 2018.
Benjamin Guedj served as a jury member for the PhD defense of Mahmoud Albardan, Univ. Lille, October 2018.
Sophie Dabo-Niang was a referee at the HDR defense of Tristan Kenga Kiesse, University of Rennes 1, October 22, 2018.
Sophie Dabo-Niang was a referee at the PhD defense of Ousmane Cisse, University Paris 1, December 11th, 2018, and of Julien Ndrin, University of Abidjan (Côte-d'Ivoire), April, 19th, 2018.
Sophie Dabo-Niang was a referee of the PhD dissertation of Javier Álvarez Lièbana, University of Granada (Spain), April, 2018.
Christophe Biernacki acted as a reviewer for PhD theses and one HdR defense. He also acted as an examinator for one PhD thesis and for one HdR defense.

10.3. Popularization

10.3.1. Internal or external Inria responsibilities

Guillemette Marot is responsible of bilille, the bioinformatics and bioanalysis platform of Lille. More information about the platform is available at https://wikis.univ-lille.fr/bilille/.

Benjamin Guedj is an appointed deputy member of CLHSCT (Inria LNE).

Benjamin Guedj is an elected member of the Evaluation Committee (CE, Inria).

10.3.2. Internal action

- Pascal Germain gave a talk at the “30 minutes de sciences” seminar of Inria Lille (21/03/2018).
- Pascal Germain gave a talk vulgarizing his work at the “Café des sciences” of Inria Rocquencourt (13/11/2018).
- Guillemette Marot gave a talk at the “30 minutes de sciences” seminar of Inria Lille (21/12/2018).

RANDOPT Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

- Anne Auger is the General Chair of the forthcoming ACM GECCO 2019 conference, Prague CZ (largest and most prestigious conference in the Evolutionary Computation domain).

10.1.2. Member of the Organizing Committees

- Anne Auger, Dimo Brockhoff and Nikolaus Hansen, co-organizer of the ACM-GECCO-2018 workshop on Black Box Optimization Benchmarking, together with Julien Bect, Rodolphe Le Riche, Victor Picheny, and Tea Tušar
- Anne Auger, Dimo Brockhoff, Nikolaus Hansen, and Konstantinos Varelas, co-organizer of the ACM-GECCO-2019 workshop on Black Box Optimization Benchmarking, together with Tea Tušar
- Dimo Brockhoff: co-organization of the Lorentz Center workshop on Many-Criteria Optimization (MACODA), September 2019, with Boris Naujoks, Michael Emmerich, and Robin Purshouse

10.1.3. Scientific Events Selection

10.1.3.1. Chair of Conference Program Committees

- Anne Auger has been program chair of the PPSN 2018 conference, Coimbra, Portugal.
- Anne Auger was Theory track chair for the ACM GECCO 2018 conference, Kyoto, Japan.
- Nikolaus Hansen was ENUM track chair for the ACM GECCO 2018 conference, Kyoto, Japan.

10.1.3.2. Member of the Conference Program Committees

- Dimo Brockhoff and Nikolaus Hansen were members of the program committee of the PPSN 2018 conference.

10.1.3.3. Reviewer

- Dimo Brockhoff: GECCO'2018, GECCO'2018 student workshop, PPSN'2018, LeGO 2018, EMO'2019, and FOGA'2019

10.1.4. Journal

10.1.4.1. Member of the Editorial Boards

- Anne Auger and Nikolaus Hansen members of the editorial board of the Evolutionary Computation journal.

10.1.4.2. Reviewer - Reviewing Activities

- The three permanent members are frequent reviewers for the main two journals on Evolutionary Computation: IEEE transaction on Evolutionary Computation, Evolutionary Computation.
- Anne Auger is guest editor of Algorithmica special issue of papers selected from GECCO theory tracks 2018
- Anne Auger is guest editor of IEEE Transactions on Evolutionary Computation special issue on Theoretical Foundations of Evolutionary Computation 2018/2019

10.1.5. Invited Talks

- Dimo Brockhoff: "Benchmarking multiobjective optimizers: An algorithmic jam session of recent results", December 2018, Centre for Informatics and Systems, University of Coimbra, Portugal

10.1.6. Leadership within the Scientific Community

- Anne Auger, Elected Member of the ACM-SIGEVO executive board
- Dimo Brockhoff, member of the International Advisory Committee for EMO-2019 in East Lansing, USA

10.1.7. Scientific Expertise

- Anne Auger scientific expert for an audit on Artificial Intelligence of a large French industrial consortium.
- Dimo Brockhoff, external reviewer for the Luxembourg National Research Fund (FNR) in the CORE 2018 call

10.1.8. Research Administration

- Anne Auger, member of the conseil de laboratoire of the CMAP, Ecole Polytechnique.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

- Master: Anne Auger, Course on Derivative-free Optimization of AMS and Optimization masters, 22.5 hours M2, Paris-Saclay University
- Master: Anne Auger, exercises for the courses Introduction to Machine Learning (MAP 534), M2 X/HEC and Advanced Machine Learning (MAP 541), 30 hours, Ecole Polytechnique, France
- Master: Anne Auger, exercises for the courses Advanced Machine Learning (MAP 541), M2 X/HEC and Advanced Machine Learning (MAP 541), 30 hours, Ecole Polytechnique, France
- Master: Anne Auger, 2nd year students of Ecole Polytechnique, Datacamp (solving practical machine learning problems) MAP 583, 20 hours, Ecole Polytechnique, France
- Master: Anne Auger, “Advanced Optimization”, 9h ETD, M2, Université Paris-Sud, France (joint course with D. Brockhoff)
- Master: Dimo Brockhoff, “Introduction to Optimization”, 31.5h ETD, M2, Université Paris-Sud, France
- Master: Dimo Brockhoff, “Advanced Optimization”, 22.5h ETD, M2, Université Paris-Sud, France (joint course with A. Auger)

10.2.2. Tutorials

- Dimo Brockhoff gave the tutorial “Evolutionary Multiobjective Optimization” at the GECCO-2018 conference in Kyoto, Japan [9]
- Nikolaus Hansen gave the tutorials “CMA-ES and Advanced Adaptation Mechanisms” [8] and “A Practical Guide to Experimentation (and Benchmarking)” [11] at the GECCO-2018 conference in Kyoto, Japan.

10.2.3. Supervision

- PhD in progress: Konstantinos Varelas, “Large-Scale Optimization, CMA-ES and Radar Applications”, Dec. 2017, Anne Auger and Dimo Brockhoff
- PhD in progress: Cheikh Touré, “Linearly Convergent Multi-objective Stochastic Optimizers”, Dec. 2017, Anne Auger and Dimo Brockhoff
- PhD in progress: Paul Dufossé, “Constrained Optimization and Radar Applications”, Oct. 2018, Nikolaus Hansen
- PhD in progress: Marie-Ange Dahito, “Mixed-Integer Blackbox Optimization for Multiobjective Problems in the Automotive Industry”, Jan 2019, Dimo Brockhoff and Nikolaus Hansen

10.2.4. Juries

- Anne Auger, member of Hiring committee for assistant professor positions for Toulouse 1 Capitole University, MCF 0225, section CNU 27
- Anne Auger, PhD jury of Asmaa Ghoumari, defense in Dec. 2018
- Dimo Brockhoff, PhD jury of Lukas Bajer, Charles University Prague, Czech Republic, defense in June 2018
- Dimo Brockhoff, PhD jury of Andreia P. Guerrero, University of Coimbra, Portugal, defene in December 2018

10.3. Popularization

10.3.1. Interventions

- National events: Cheikh Touré made an intervention on Poker for "college" students at the Fête de la Science (explaining relation between the game and probability)

REALOPT Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

The Team has organized ISMP, the major Mathematical Programming conference (around 1900 people). ISMP is the triennial international congress of mathematical optimization, where scientists from all over the world as well as industrial practitioners of mathematical optimization meet in order to present their most recent developments and results and to discuss new challenges from theory and practice. It is the symposium of the Mathematical Optimization Society (MOS).

https://ismp2018.sciencesconf.org/

François Vanderbeck was Chair of the conference.

10.1.1.2. Member of the Organizing Committees

All members of the team have been member of ISMP Organizing Committee.

10.1.2. Scientific Events Selection

10.1.2.1. Chair of Conference Program Committees

Olivier Beaumont: Program Chair HIPC https://hipc.org

10.1.2.2. Member of the Conference Program Committees

- Lionel Eyraud-Dubois: Euro-Par'18, ICPP'18,
  - IPDPS'18 http://www.ipdps.org
  - Euro-Par'18 https://europar2018.org
  - ICPP'18 http://oaciss.uoregon.edu/icpp18/index.php
- Pierre Pesneau: ISCO 2018
- Ruslan Sadykov, Boris Detienne, Pierre Pesneau, Lionel Eyraud-Dubois, Olivier Beaumont: https://ismp2018.sciencesconf.org
- François Clautiaux: http://roadef2018.labsticc.fr/wp/
- Olivier Beaumont:
  - SuperComputing'18 https://sc18.supercomputing.org
  - IPDPS'18 (primary PC member) http://www.ipdps.org
  - IPDPSW'18 http://www.ipdps.org/ipdps2018/2018_call_for_workshops.html
  - HeteroPar'18 https://hcl.ucd.ie/heteropar2018/
  - HPML'18 https://hpml2018.github.io

10.1.2.3. Reviewer

- Lionel Eyraud-Dubois: SC

10.1.3. Journal

10.1.3.1. Reviewer - Reviewing Activities

- Lionel Eyraud-Dubois: JOSH, TPDS

- François Clautiaux: European Journal of Operational Research, International Transactions on Operations Research, Asia-Pacific Journal of Operational Research
- Pierre Pesneau : Discrete Applied Math.
- Ruslan Sadykov: Transportation Science, European Journal of Operational Research, Journal of Scheduling, Operations Research Letters, Mathematical Programming Computation
- Olivier Beaumont: TPDS, IJHPCA

10.1.4. Invited Talks

- François Clautiaux: Invited seminar at Séminaire parisien d'optimisation (December 10th 2018)
- François Clautiaux: Invited talk at MEXICO working group (November 13th, 2018)
- Olivier Beaumont: Invited talk at the 13th Scheduling for Large Scale Systems Workshop, Lawrence Berkeley National Laboratory, California http://scheduling-workshop.tk
- Ruslan Sadykov: Invited talk at the seminar of the Faculty of Economics and Business, KU Leuven, Belgium (June 6th, 2018)

10.1.5. Leadership within the Scientific Community

François Clautiaux is Secretary of ROADEF, the French OR association

10.1.6. Research Administration

- Olivier Beaumont and François Clautiaux are WorkPackage leaders of the Idex Cluster SysNum https://sysnum.labex.u-bordeaux.fr/en/
- Olivier Beaumont is the head of Commission Jeunes Chercheurs and Commission Délégations at Inria Bordeaux Sud-Ouest.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Licence : François Clautiaux, Grands Domaines de l'Optimisation

Master : François Clautiaux, Gestion des Opérations et Planification de la Production, 58 heqTD, M2, Université de Bordeaux

Master : François Clautiaux, Combinatoire et logistique, 29 heqTD, M2, Université de Bordeaux

Master : François Clautiaux, Introduction à la programmation en variables entières, 29 heqTD, M2, Université de Bordeaux

Master : François Clautiaux, Outils logiciels pour l'optimisation, 29 heqTD, M2, Université de Bordeaux

Master: François Clautiaux, Combinatoire et routage, 15 heqTD, ENSEIRB INPB

Master : Lionel Eyraud-Dubois et Olivier Beaumont, Approximation et BigData, 29 heqTD, M2, Université de Bordeaux

Licence : Pierre Pesneau, Grands Domaines de l'Optimisation, L1, Université de Bordeaux

Licence : Pierre Pesneau, Programmation pour le calcul scientifique, 24 heqTD, L2, Université de Bordeaux

Licence : Pierre Pesneau, Optimisation, 59 heqTD, L2, Université de Bordeaux

Master : Pierre Pesneau, Algorithmique et Programmation 1, 28 heqTD, M1, Université de Bordeaux

Master : Pierre Pesneau, Algorithmique et Programmation 2, 29 heqTD, M1, Université de Bordeaux

Master : Pierre Pesneau, Optimisation dans les graphes, 15 heqTD, M1, Université de Bordeaux

Master : Pierre Pesneau, Programmation linéaire, 15 heqTD, M1, Université de Bordeaux

DUT Informatique : Pierre Pesneau, Recherche Opérationnelle, 24 heqTD, IUT de Bordeaux

Master : Ruslan Sadykov, Introduction to Constraint Programming, 29 heqTD, M2, Université de Bordeaux

10.2.2. Supervision

PhD : Thomas Bellitto, Walks, Transitions and Geometric Distances in Graphs. 27/08/2018, Arnaud Pêcher (dir) and Christine Bachoc (dir).

PhD : Rodolphe Griset, Robust planning in Electricity production, 15/11/2018, Boris Detienne (dir) and François Vanderbeck (dir).

PhD : Quentin Viaud, Mathematical Programming Methods for Complex Cutting Problems, Université de Bordeaux, 11/12/2018, François Clautiaux (dir), Ruslan Sadykov (dir), François Vanderbeck (co-dir)

PhD : Jérémy Guillot, Résolution exacte de problèmes de couverture par arborescences sous contraintes de capacité, 18/12/2018, François Clautiaux (dir) and Pierre Pesneau (dir).

PhD in progress : Alena Shilova, Scheduling for Deep Learning Frameworks from October 2018, Olivier Beaumont (dir) and Alexis Joly (dir)

PhD in progress: Tobias Castanet, Use of Replication in Distributed Games from September 2018, Olivier Beaumont (dir), Nicolas Hanusse (dir) and Corentin Travers (dir).

PhD in progress : Imen Ben Mohamed, Location routing problems, from October 2015, Walid Klibi (dir), Ruslan Sadykov (dir), François Vanderbeck (co-dir).

PhD in progress : Guillaume Marques, Planification de tournées de véhicules avec transbordement en logistique urbaine : approches basées sur les méthodes exactes de l'optimisation mathématique, from September 2017, Ruslan Sadykov (dir) and François Vanderbeck (co-dir)

PhD in progress : Gaël Guillot, Aggregation and disaggregation methods for hard combinatorial problems, from November 2017, François Clautiaux (dir) and Boris Detienne (dir).

PhD in progress : Orlando Rivera Letelier, Bin Packing Problem with Generalized Time Lags, from May 2018, François Clautiaux (dir) and Ruslan Sadykov (co-dir), a co-tutelle with Universidad Adolfo Ibáñez, Peñalolén, Santiago, Chile.

10.2.3. Juries

- François Clautiaux HDR : Mahdi Moeini (Toulouse, rapporteur) ; PhD thesis: E´milie Joannopoulous (Rennes, rapporteur), Dehia Ait-Ferhat (Grenoble, rapporteur), Stefania Pan (Paris 13, rapporteur), Mikae¨l Capelle (Toulouse, examinateur), Pierre-Antoine Morin (Toulouse, examinateur)
- Ruslan Sadykov : PhD thesis of Daniel Kowalczyk (KU Leuven, Belgium)

10.3. Popularization

Organizations

- Local events: "Journée emploi maths et interaction 2018". This day aims to bring together students, researchers and practitioners in mathematics in the Bordeaux area. https://uf-mi.u-bordeaux.fr/sites/jemi/

Interventions

- National events: Fête de la Science in Bordeaux (P. Pesneau and F. Clautiaux)
- RealOpt participated to the events related to the anniversary of Inria BSO

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 co-organized (with Christophe Giraud and Gilles Stoltz) the conference "Deux complices en statistique" (Two days in honor of Pascal Massart and Lucien Birgé), at IHES (Bures-sur-Yvette) and IMO (Orsay).

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 Ann Arbor, USA.
- Sylvain Arlot is one of the co-organizers of the Junior Conference on Data Science and Engineering at Paris-Saclay (3nd edition in 2018).

9.1.2. Scientific Events Selection

9.1.2.1. Member of the Conference Program Committees

Jean-Michel Poggi was a member of the Scientific Programme Committee, ENBIS 2018, Nancy, 2-6, September 2018, and member of the Scientific Committee of the summer school on Clustering, Data, Analysis And Visualization Of Complex Data, May 21-25, 2018.

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*.

Sylvain Arlot is associate editor for the Annales de l'Institut Henri Poincaré B, Probability and Statistics.

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 2018.

9.1.5. Leadership within the Scientific Community

Jean-Michel Poggi is:

- Vice-President of ECAS (European Courses in Advanced Statistics)
- Council Member of the ISI (2015-19)
- Member of the Board of Directors of the ERS of IASC (since 2014)
- Council member of FENStatS (Federation of European National Statistical Societies)

9.1.6. Scientific Expertise

Jean-Michel Poggi was member of the Box Medal committee for 2018, and in the jury for the Marie-Jeanne Laurent Duhamel prize (SFdS).

9.1.7. Research Administration

Jean-Michel Poggi is the vice-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.

Christine Keribin is treasurer of the Société Française de Statistique (SFdS).

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: Neska El Haouij, 2014, Jean-Michel Poggi, Meriem Jaïdane, Raja Ghozi (ENIT Tunisie), and Sylvie Sevestre-Ghalila (CEA LinkLab). Defended in July 2018.

PhD: Florence Ducros, 2015, Gilles Celeux and Patrick Pamphile. Defended June 2018.

PhD in progress: Claire Brécheteau, 2015, Pascal Massart

PhD in progress: Hedi Hadiji, 2017, Pascal Massart

PhD in progress: Guillaume Maillard, 2016, Sylvain Arlot and Matthieu Lerasle

PhD in progress: Jeanne Nguyen, 2015, Claire Lacour and Vincent Rivoirard (Univ Paris Dauphine)

PhD in progress: Benjamin Goehry, 2015, Pascal Massart and Jean-Michel Poggi

PhD in progress: Tuan-Binh Nguyen, 2018, Sylvain Arlot and Bertrand Thirion

9.2.3. Juries

HDR: Emilie Lebarbier (Pascal Massart, referee; Sylvain Arlot, president)

Members of SELECT have participated in numerous juries during 2018.

SEQUEL Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. EWRL 2018

We organized the 14th European Workshop on Reinforcement Learning (EWRL) in October 2018 in Lille. 183 people registered. Despite its name, the audience goes really beyond Europe with 42 from North Amercia, 38 from France, 19 from Germany, 16 from the UK, 12 from Italy, 12 from Israel, 9 from Belgium, ... 40% of participants were students, mostly PhD students, but also some Master students. Among non students, 40% came from industry, the other 60% being academics. We had a quite unique panel of invited speakers highlighted by historical figures of reinforcement learning with Prof. Richard Sutton (U. Alberta and Deepmind), bandit theory with Tze Leung Lai (Stanford U.). EWRL is really the main scientific event on reinforcement learning in the world today.

After 2008 and 2015, this is the third time EWRL is organized in Lille.

10.1.1.2. General Chair, Scientific Chair

M. Valko was a program co-chair for CNRS Summer school on Networks, Graphs, and Machine Learning (RESCOM 2018)

10.1.1.3. Member of the Organizing Committees

- F. Strub, co-organizer of the workshop "Visually Grounded Interaction and Language (ViGIL)" at NIPS 2018
- M. Valko was an organizing co-chair of the ITS Workshop: Optimizing Human Learning (ITS 2018)
- R. Fruit, M. Seurin, M. Pirotta, F. Strub organized the 14th European Workshop on Reinforcement Learning

10.1.2. Scientific Events Selection

10.1.2.1. Member of the Conference Program Committees

- Philippe Preux: SPC IJCAI 2018; PC of ICML, ECML, LOD, EWRL, and French speaking conferences: EGC, SFC JFPDA
- Michal Valko: Area Chair of NIPS 2018, Top 10 reviewer recognition for reviewing at ICML
- Emilie Kaufmann: PC Chair for WiML 2018, Top 10 reviewer recognition for reviewing at ICML
- Odalric-ambrym Maillard: PC chair for ALT

10.1.2.2. Reviewer

Members of SEQUEL have been involved in the following reviewing activities for conferences in 2018:

- AI&Stats, NIPS, ALT, ICML, COLT, IJCAI

10.1.3. Journal

10.1.3.1. Reviewer - Reviewing Activities

- The Annals of Statistics
- Journal of Machine Learning Research
- Machine Learning Research
- Bernoulli
- Annual Reviews in Control
- European Journal of Operation Research
- Information and Inference: a Journal of the IMA (Institute of Mathematics and its Application)
- Operations Research
- IEEE Transactions on Signal Processing

10.1.4. Invited Talks

- Odalric-Ambrym Maillard: invited Opponent for the PhD defence of Stefan Magureanu (Stockholm, Sweden), February 2018
- Odalric-Ambrym Maillard: invited speaker at LTCI, Telecom ParisTech, February 2018
- Odalric-Ambrym Maillard: invited speaker at Journées Probabilités et statistiques de Lille, June 22, 2018
- Odalric-Ambrym Maillard: invited speaker at RL Lab, McGill University, August 23, 2018
- Odalric-Ambrym Maillard: invited speaker at the 21st IBIS conference (Sapporo, Japan), November 06, 2018
- Odalric-Ambrym Maillard: invited speaker at the RIKEN Institute (Tokyo, Japan), November 07, 2018
- Michal Valko: *The power of graphs in speeding up online learning and decision making* Presented on October 23rd, DeepMind, London, UK (*DeepMind 2018*)
- Michal Valko: *Active block-matrix completion with adaptive confidence sets*, Presented on September 10–13th, 2018, International Workshop on Optimization and Machine Learning, CIMI, Toulouse (*CIMI 2018*)
- Michal Valko: *Online influence maximization*, Presented on May 14th, 2018, Workshop on Graph Learning, LINCS, Paris (*LINCS 2018*)
- Michal Valko: *Recommender systems*, Presented on March 22nd, 2018, Journée Big data, Polytech'Lille (*Polytech'Lille 2018*)
- Michal Valko: *Pliable rejection sampling*, Presented on February 8th, 2018 at GDR Isis, Télécom ParisTech in Paris (*ISIS 2018*)
- Michal Valko: *Graph Bandits*, Presented on January 7th, 2018 at MIST conference in Rajecká Lesná (*MIST 2018*)
- Pierre Perrault: *Stochastic multi-arm bandit problem and some extensions*, Presented on November, 23rd, 2018 at Lambda seminar at Université de Bordeaux (*Lambda 2018*)
- Emilie Kaufmann: *(Optimal) Best Arm Identification and applications to Monte-Carlo Tree Search*, presented on January, 18th, 2018 at the Probability and Statistics seminar of IECL, Nancy
- Emilie Kaufmann: *Bandits (for) Games*, presented on March 26th, 2018 at Amazon Research, Berlin
- Emilie Kaufmann, *Bandits (for) Games*, presented on April 25th, 2018 as an invited talk to the Workshop on Modern Challenges on Learning Theory at Univerisé de Montréal

- Emilie Kaufmann, *Bandits (for) Games*, presented on June 13th, 2018 as an invited talk to the Paris Symposium on Game Theory, Paris
- Emilie Kaufmann *New tools for Adaptive Testing and Applications to Bandit Problems*, presented on December 3rd, 2018 at the Probability and Statistics seminar of IRMA, Strasbourg

10.1.5. Scientific Expertise

- Philippe Preux was a member of the hiring committee for CR at Inria Nancy
- Philippe Preux was a member of the hiring committee for an associate professor at Université de Lille
- Philippe Preux evaluated submissions to ANRT (he also declined many such invitations due to lack of time)
- Philippe Preux was a member of an auditing committee of an international company which can not be named (NDA)
- Philippe Preux participates to a "AI mission" with an (other) international company which can not be named (NDA)
- Odalric-Ambrym Maillard evaluated a submission to OTKA (Hungarian ANR), and to ANR.
- M. Valko is an elected member of the evaluation committee and participates in the hiring, promotion, and evaluation juries of Inria, notably
  - Selection committee for Inria award for scientific excellence of confirmed researchers
  - Inria working group for the creation of team RandOpt
  - National committee for the secondments at Inria
- Michal Valko participates in a collaboration with an international company which can not be named (NDA)
- Emilie Kaufmann was a member of the hiring committee for an associate professor position at Université de Lille
- Emilie Kaufmann was a member of the hiring committee for an associate professor at ENS Paris (Computer Science departement)

10.1.6. Research Administration

- Philippe Preux is:
  - "délégué scientifique adjoint" of the Inria center in Lille
  - member of the Inria evaluation committee (CE)
  - member of the Inria internal scientific committee (COSI)
  - member of the scientific committee of CRIStAL
  - the head of the "Data Intelligence" thematic group at CRIStAL
- Michal Valko is a member of the Inria evaluation committee (CE)

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Master: E. Kaufmann, Spring 2018, Data Mining, M1 Maths/Finances, Université de Lille (36 hours)

Master: E. Kaufmann, Spring 2018, Machine Learning, M2 Maths/Finances, Université de Lille (18 hours)

Master: M. Valko, 2018/2019: Graphs in Machine Learning, 36h eqTD, M2, ENS Cachan

Master: O. Maillard, Spring 2018: Sequential Learning course, parcours DAD, 30h eqTD, Ecole Centrale Lille.

Master: O. Maillard, January 2018: Sequential Learning tutorial, Technicolor, 6h eqTD, Rennes

10.2.2. Supervision

PhD completion: Merwan Barlier, Human-in-the loop reinforcement learning for dialogue systems, started Oct. 2014, advisor: Olivier Pietquin

PhD completion: Alexandre Bérard, Deep learning for post-editing and automatic translation, started Oct. 2014, advisor: Olivier Pietquin

PhD in progress: Lilian Besson, Bandit approach to improve Internet Of Things Communications, started Oct. 2016, advisor: Émilie Kaufmann, Christophe Moy (CentraleSupélec Rennes)

PhD in progress: Ronan Fruit, Exploration-exploitation in hierarchical reinforcement learning, Inria, started Dec. 2015, advisor: Daniil Ryabko, 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: Édouard Leurent, Autonomous vehicle control: application of machine learning to contextualized path planning, started Oct. 2017, advisor: Odalric Maillard, Philippe Preux, Denis Effimov (NON-A), Wilfrid Perruquetti (NON-A)

PhD aborted: Sheikh Waqas Akhtar, Bandits for non-stationarity and structure, started Oct. 2017, advisor: Odalric Maillard, Daniil Ryabko.

PhD in progress: Pierre Perrault, Online Learning on Streaming Graphs, started Sep. 2017, advisor: Michal Valko; Vianney Perchet

PhD in progress: Mathieu Seurin, Multi-scale rewards in reinforcement learning, started Oct. 2017, advisor: Olivier Pietquin, Philippe Preux

PhD in progress: Julien Seznec, Sequential Learning for Educational Systems, started Mar. 2017, advisor: Michal Valko; Alessandro Lazaric, Jonathan Banon

PhD in progress: Xuedong Shang, Adaptive methods for optimization in stochastic environments, started Oct. 2017, advisor: Émilie Kaufmann, Michal Valko

PhD in progress: Florian Strub, Reinforcement Learning for visually grounded interaction, started Jan. 2016, advisors: Olivier Pietquin and Jeremie Mary

PhD in progress: Kiewan Villatel, Deep Learning for Conversion Rate Prediction in Online Advertising, started Oct. 2017, advisor: Philippe Preux

PhD in progress: Yannis Flet-Berliac, start Oct. 2018

PhD in progress: Hassan Saber, start Oct. 2018, Structured Multi-armed bandits, advisor: Odalric Maillard, Philippe Preux.

PhD in progress: Omar Darwiche, start Oct. 2018, Sequential Learning in Dynamic Environments, advisor: Émilie Kaufmann, Michal Valko

10.2.3. Juries

PhD and HDR juries:

- É. Kaufmann:
  - Stefan Magureanu, KTH Stockholm, February 20th, 2018
  - Valentin Reis, LIG, Grenoble, September 28th, 2018
  - Maryam Aziz, Northestearn University (Boston), December 6th, 2018
- O. Maillard: Stefan Magureanu, February 20th, 2018
- Ph. Preux:

  - Saeed Varasteh Yazdi, LIG, Grenoble
  - Fabien Vilar, Marseille
  - Merwan Barlier, Lille
- M. Valko:
  - *Pierre Ménard*, Université Toulouse 3 Paul Sabatier, June 2018, Sur la notion d'optimalité dans les problèmes de bandits stochastiques. *Reviewer*
  - *Mariana Vargas Vieyra*, Université Lille, September 2017, Adaptive graph learning with application to natural language processing. *Ph.D. mid-term evaluation reviewer*

10.3. Popularization

10.3.1. Internal or external Inria responsibilities

Philippe Preux chaired the Inria evaluation seminar of theme "Optimization, machine learning and statistical methods" in March 2018.

10.3.2. Articles and contents

- Ph. Preux interviewed for various journals ("Les échos", ...).
- Adobe research highlights M. Valko's work on online influence maximization presented (January 2018)
- Daniele Calandriello (supervised by A. Lazaric and M. Valko) wins the prize for the Best AI Thesis in France in 2018. Articles in:
  - La Voix du Nord
  - CNRS journal
  - Newstank
  - Lille1
  - Actu

10.3.3. Education

- Ph. Preux presented and animated 3 sessions on AI at the "congrès annuel du réseau national professionnel des cultures scientifique technique et industrielle" (Amcsti)

10.3.4. Interventions

- Philippe Preux:
  - presented AI related to health industry at the yearly general assembly of Eurasanté
  - presented and animated 3 sessions on AI at the "congrès annuel du réseau national professionnel des cultures scientifique technique et industrielle" (Amcsti)
  - participated to a panel at Conext forum (Lille)
- the work on Guesswhat?!:
  - has been invited to be presented on the Inria booth during The Web Conf in Lyon
  - is presented at the Inria showroom inaugurated in Dec. 2018 in Lille

10.3.5. Creation of media or tools for science outreach

- Ph. Preux was interviewed for a video about robots and AI

SIERRA Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

F. Bach: General Chair of ICML 2018 (Stockholm)

10.1.1.2. Member of the Organizing Committees

Adrian Taylor, Session Organizer: *Computer-assisted analyses of optimization algorithms I & II*, International Symposium on Mathematical Programming, July 2018.

F. Bach: Co-organization of the workshop "Horizon Maths 2018 : Intelligence Artificielle", November 23, 2018

10.1.2. Scientific Events Selection

10.1.2.1. Chair of Conference Program Committees

F. Bach: Program Chair of the Journées de Statistiques (Saclay)

10.1.2.2. Reviewer

Conference on Learning Theory (COLT 2018): Pierre Gaillard, Alessandro Rudi

Symposium on Discrete Algorithms (SODA 2019): Adrien Taylor,

Neural Information Processing Systems (NIPS 2018): Pierre Gaillard, Alessandro Rudi

Conference on Learning Theory (COLT 2018): Pierre Gaillard, Alessandro Rudi, Adrien Taylor

Symposium on Discrete Algorithms (SODA 2019): Adrien Taylor

International Conference of Machine Learning (ICML 2018): Pierre Gaillard, Alessandro Rudi

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

F. Bach: Journal of Machine Learning Research, co-editor-in-chief

F. Bach: Information and Inference, Associate Editor.

F. Bach: Electronic Journal of Statistics, Associate Editor.

F. Bach: Mathematical Programming, Associate Editor.

F. Bach: Foundations of Computational Mathematics, Associate Editor.

A. d'Aspremont: SIAM Journal on Optimization, Associate editor

A. d'Aspremont: SIAM Journal on the Mathematics of Data Science, Associate Editor

A. d'Aspremont: Mathematical Programming, Associate Editor

10.1.3.2. Reviewer - Reviewing Activities

SIAM Journal on Optimization: Adrien Taylor

Mathematical Programming: Adrien Taylor

Journal of Optimization Theory and Algorithms: Adrien Taylor

Journal of Machine Learning Research: Pierre Gaillard, Alessandro Rudi

Applied Computational Harmonic Analysis: Alessandro Rudi

10.1.4. Invited Talks

F. Bach, Trends in Optimization Seminar, University of Washington, November 2018.

Pierre Gaillard. *Distributed averaging of observations in a graph: the gossip problem*. MNL Conference, Paris, November 2018.

Adrien Taylor, *Analysis and design of first-order methods via semidefinite programming*, Seminaire Parisien dOptimisation (SPO), Paris (France), November 2018.

F. Bach, Frontier Research and Artificial Intelligence, European Research Council, Brussels, October 2018.

F. Bach, IDSS Distinguished Speaker Seminar, MIT, October 2018.

F. Bach, Mathematical Institute Colloquium, Oxford, October 2018.

Adrien Taylor, *Convex Interpolation and Performance Estimation of First- order Methods* for Convex Optimization, IBM/FNRS innovation award, Brussels (Belgium), October 2018.

F. Bach, Workshop on Structural Inference in High-Dimensional Models, Moscow, September 2018.

F. Bach, Symposium on Mathematical Programming (ISMP), Bordeaux, plenary talk, July 2018.

Alexandre d'Aspremont, *Sharpness, Restart and Compressed Sensing Performance*, ISMP 2018, Bordeaux, July 2018.

Alessandro Rudi, *FALKON: An optimal method for large scale learning with statistical guarantees*, ISMP 2018, Bordeaux, July 2018.

Adrien Taylor, *Computer-assisted Lyapunov-based worst-case analyses of first- order methods*, International Symposium on Mathematical Programming, Bordeaux (France), July 2018.

F. Bach, SIAM Conference on Imaging Science, Bologna, Italy, invited talk, June 2018.

Pierre Gaillard. *Online prediction of arbitrary time-series with application to electricity consumption*. Conference on nonstationarity. Cergy Pontoise University. June 2018.

Adrien Taylor, *Convex Interpolation and Performance Estimation of First-order Methods for Convex Optimization*, International Symposium on Mathematical Programming: Tucker prize finalist, Bordeaux (France), July 2018.

Alexandre d'Aspremont, *An approximate Shapley-Folkman Theorem*, Isaac Newton Institute, Cambridge, June 2018.

F. Bach,Workshop on Future challenges in statistical scalability, Newton Institute, Cambridge, UK, June 2018.

Adrien Taylor, *Automated design of first-order optimization methods*, Operation Research Seminar, UCLouvain, Louvain-la-Neuve (Belgium), May 2018.

Adrien Taylor, *Automated design of first-order optimization methods*, LCCC Control Seminar, Lund University, Lund (Sweden), May 2018.

Pierre Gaillard. *Distributed learning with orthogonal polynomials*. Inria DGA meetup. May 2018.

F. Bach, Workshop on Optimisation and Machine Learning in Economics, London, March 2018.

Pierre Gaillard. *An overview of Artificial Intelligence*. Hackaton. PSL University. March 2018.

Alexandre d'Aspremont, *Regularized Nonlinear Acceleration*, US and Mexico Workshop on Optimization and its Applications, Jan 2018.

Alessandro Rudi, *Learning with Random Features*, Isaac Newton Institute, Cambridge, Jan 2018.

Pierre Gaillard. *Online nonparametric regression with adversarial data.* Smile seminar. Paris. Jan 2018.

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

F. Bach (together with N. Chopin), *Graphical models*, 30h, Master M2 (MVA), ENS Cachan, France.

F. Bach, *Optimisation et apprentissage statistique*, 20h, Master M2 (Mathématiques de l'aléatoire), Université Paris-Sud, France.

Alexandre d'Aspremont, *Optimisation Combinatoire et Convexe*, avec Zhentao Li, (2015-Present) cours magistraux 30h, Master M1, ENS Paris.

Alexandre d'Aspremont, *Optimisation convexe: modélisation, algorithmes et applications* cours magistraux 21h (2011-Present), Master M2 MVA, ENS PS.

F. Bach and P. Gaillard, *Apprentissage statistique*, 35h, Master M1, Ecole Normale Supérieure, France.

P. Gaillard (together with V. Perchet), *Prediction of individual sequences*, 21h, Master M2 MVA, ENS Cachan, France.

Gregoire Mialon, Python for Machine Learning, 21h, M2 MASH, Dauphine-ENS-PSL, Paris.

10.2.2. Supervision

Anaël Bonneton, PhD defended on July 2018, co-advised by Francis Bach, located in Agence nationale de la sécurité des systèmes d'information (ANSSI).

Damien Scieur, PhD defended on September 2018. *Sur l'accélération des méthodes d'optimisation*, supervised by Alexandre d'Aspremont and Francis Bach.

Jean-Baptiste Alayrac, PhD defended on September 2018, *Structured Learning from Videos and Language*, supervised by Simon Lacoste-Julien, Josef Sivic and Ivan Laptev.

Antoine Recanati, PhD. defended on November 2018. *Application du problème de sériation au séquençage de l'ADN et autres relaxations convexes appliquées en bioinformatique*, supervised by Alexandre d'Aspremont.

Rémi Leblond, PhD defended on November 2018, *Asynchronous Optimization for Machine Learning*, supervised by Simon Lacoste-Julien.

Mathieu Barre, PhD in progress *Méthodes d'extrapolation, au-delà de la convexité*, supervised by Alexandre d'Aspremont.

Grégoire Mialon, PhD in progress *Algorithmes d'optimisation, méthodes de régularisation et architectures pour les réseaux de neurones profonds dans un contexte où les données labellisées sont rares*, supervised by Alexandre d'Aspremont.

Radu-Alexandru Dragomir, PhD in progress *Non-Euclidean first-order methods*, supervised by Alexandre d'Aspremont and Jérôme Bolte.

Thomas Kerdreux, PhD in progress *Optimisation and machine learning*, supervised by Alexandre d'Aspremont.

Margaux Brégère, PhD in progress started September 2017, supervised by Pierre Gaillard, Gilles Stoltz and Yannig Goude (EDF R&D).

Raphaël Berthier, PhD in progress started September 2017, supervised by Francis Bach and Pierre Gaillard.

Loucas Pillaud-Vivien, PhD in progress, supervised by Francis Bach and Alessandro Rudi.

Alex Nowak, PhD in progress, supervised by Francis Bach and Alessandro Rudi.

Ulysse Marteau Ferey, PhD in progress, supervised by Francis Bach and Alessandro Rudi.

Dmitry Babichev, PhD in progress, started is September 2015, co-advised by Francis Bach and Anatoly Judistky (Univ. Grenoble).

Tatiana Shpakova, PhD in progress, started September 2015, advised by Francis Bach.

10.2.3. Juries

Alexandre d'Aspremont, Habilitation à diriger des recherches. Thomas Bruls, Genoscope, Université d'Evry.

10.3. Popularization

10.3.1. Creation of media or tools for science outreach

Design and implementation of a demonstration for the permanent exhibit at Palais de la Découverte: "L'apprenti illustrateur" (J.-B. Alayrac, F. Bach)

TAU Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. General Chair, Scientific Chair

Guillaume Charpiat Workshop Statistics/Learning at Paris-Saclay 2018

Isabelle Guyon Competition co-chair, ECML 2019

Michele Sebag Séminaire Annuel Académie des Technologies, 2018.

In 2016, Isabelle Guyon was Program Chair of NIPS (Neural Information Processing Systems) – with an increase of more than 40% in the number of submissions, 96% in terms of reviewers, and over 100% in terms of attendees as compared to the previous year. Lessons learned from the review process are described in a JMLR paper [19].

10.1.1.2. Member of Organizing Committees

Isabelle Guyon Advisory committee BayLearn 2018; Co-organizer WCCI 2018 Special Session on Intelligent Power Systems; Co-organizer WCCI 2018 Special Session on Machine Learning and Deep Learning Methods applied to Vision and Robotics (MLDLMVR); Co-organizer ECCV 2018 workshop Chalearn Looking at People: Inpainting and Denoising in the Deep Learning Age; Co-organizer 2018 Multimedia Information Processing for Personality & Social Networks Analysis Workshop at ICPR; Co-organizer NeurIPS 2018 workshop on Challenges in Machine Learning;

Marc Schoenauer Steering Committee, Parallel Problem Solving from Nature (PPSN); Steering Committee, Learning and Intelligent OptimizatioN (LION); organizer (with Herilalaina Rokotoarison), Workshop COSEAL, Paris, Sept. 17-18, 2018.

Michele Sebag President of Steering Committee, Eur. Conf. on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD).

10.1.2. Scientific Events Selection

10.1.2.1. Member of Conference Program Committees

All TAU members are members of the Program Committees of the main conferences in their respective fields of expertise.

10.1.2.2. Reviewer

All TAU member review papers for the most prestigious conferences in their respective fields of expertise.

10.1.3. Journal

10.1.3.1. Member of the Editorial Boards

Isabelle Guyon Action editor, *Journal of Machine Learning Research* (JMLR); series editor, *Springer series Challenges in Machine Learning* (CiML).

Marc Schoenauer Advisory Board, *Evolutionary Computation Journal*, MIT Press, and *Genetic Programming and Evolutionary Machines*, Springer Verlag; Action editor, *Journal of Machine Learning Research*(JMLR).

Michèle Sebag Editorial Board, Machine Learning, Springer Verlag.

Paola Tubaro Associate Editorial Board, *Sociology*, Sage; Member of Editorial Board, *Revue Française de Sociologie*, Presses de Sciences Po.

10.1.3.2. Reviewer - Reviewing Activities

All members of the team reviewed numerous articles for the most prestigious journals in their respective fields of expertise.

10.1.4. Invited Talks

Guillaume Charpiat *Introduction aux réseaux de neurones*, Séminaire Parisien de Mathématiques Appliquées à l'Imagerie, Paris, 3 May. 2018; *Recalage et mise à jour d'images à l'aide de réseaux de neurones*, Journée Extraction d'attributs et apprentissage pour l'analyse des images de télédétection, GDR ISIS, Paris, 18 Oct. 2018.

Flora Jay *Deep Learning Methods for Population Genetics: Inferring Changes Population Size*, Journée Inférences évolutives, GDR GE et AEIM, Paris, 16 Mai 2018; *Inferring past history from genetic data using ABC and Deep Learning approaches*, INRA GenPhySE Seminar, Toulouse, 12 Dec. 2018.

Isabelle Guyon *Codalab: crowdsourcing DataIA* DATAIA Institute Kick-Off (Data Science, Intelligence & Society), 15 Feb. 2018; *Contests of contests*, La Recherche scientifique « hors murs » au 21e siècle, Colloque de l'Académie des sciences, Fondation Del Duca, 29 Nov. 2018; *Evaluating causation coefficients*, NeurIPS 2018 workshop on causal learning, 7 Dec, 2018.

Michèle Sebag *Qualité de la vie et santé économique, étude causale*: Colloque de Cerisy (Sept. 18); séminaire Université Québec à Montréal (Dec. 18); *Causal Modeling*: KAUST Conference on Computational and Statistical Interface to Big Data (Mar. 18); Leiden wshop on Space Weather (2018); *MonteCarlo Tree Search for Algorithm Selection and Calibration*: Dagstuhl Seminar (Sept. 18); NIPS Wshop on AutoML (Dec. 18); *Ingénieures et Scientifiques*, ENPC (Juin 18). Exposés Journées Cabourg, Mar. 18; Rennes, Sep. 18; Toulouse, Oct. 18.

Marc Schoenauer *The Villani mission on Artificial Intelligence*, CISCO Heaadquarters, 9 Apr. 2018; *Le rapport Villani*, journée AFIA, 12 Apr. 2018; *Intelligence Artificielle : le rapport Villani*, Journée de la Recherche de l'Université de Brest, 25 May 2018; *Intelligence Artificielle, mythes et réalités*, Colloque Grands Projets et Systemes Complexes, Arcachon, 18 Jun. 2018; *Intelligence Artificielle, mythes et réalités*, Journée lab. CRISTAL (U. Lille), Gand, 6 Jul. 2018; *Shallow and Deep learning at TAU*, Keynote at the DATAIA-JST International Symposium on Data Science and AI, 10 Jul. 2018; *Une brève introduction à l'Intelligence Artificielle et au rapport Villani*, Académie des Technologies, 10 Oct. 2018; *Une brève introduction à l'Intelligence Artificielle*, Open-Lab PSA, 11 Oct. 2018; *A brief introduction to AI and Deep Learning*, Toulouse Symposium on Deep Learning, 18 oct. 2018; *A brief introduction to AI and Deep Learning*, PSA Stellab Seminar, Paris, 14 nov. 2018; *IA, une stratégie française : le rapport Villani*, Université Franco Italienne, Università Italo Francese, annual seminar, Paris, 21 Nov. 2018; *Some issues with Deep Learning*, Inria / Nokia-Bell Labs seminar, 27 Nov. 2018; *L'Intelligence Artificielle hier, aujourd'hui et demain*, 29e journée CASCIMODOT, Orléans, 12 Dec. 2018.

Paola Tubaro *Un champ de mines? Éthique, droit et politique dans la recherche sur les réseaux sociaux*, conférence MARAMI (Modèles & Analyse des Réseaux : Approches Mathématiques & Informatiques), Avignon, 17 Oct. 2018; *Modèles multi-agents et simulation*, Ecole thématique CNRS "Réseaux et complexité", 28 Sept. 2018; *Microworking in France: an inquiry into the human labour that makes AI possible*, OECD, Paris, 5 Dec. 2018; *Micro-work, artificial intelligence and the automotive industry*, Sant'Anna School of Advnced Studies, Pisa, 31 May 2018; *Online platform labor*, EIT Digital, Rennes, 14 Nov. 2018; *Les promesses et les périls du travail sur plateformes*, France Stratégie, 6 July 2018; *Faut-il interdire la parole problématique en ligne ?*, GEPS medical conference, Montpellier, 12 Jan. 2018

10.1.5. Leadership within the Scientific Community

Isabelle Guyon President and co-founder of ChaLearn, a non-for-profit organization dedicated to the organization of challenge.

Marc Schoenauer Chair of ACM-SIGEVO (Special Interest Group on Evolutionary Computation), 2015-2017, re-elected July 2017 (2-years term); Founding President (since 2015) 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 Programme, Institut de Convergence DataIA.

Paola Tubaro Convenor of the Social Network Analysis Group of British Sociological Association; co-founder of European Network on Digital Labor.

10.1.6. Scientific Expertise

Cécile Germain Evaluator for the H2020-2016-CNECT program; member of the DFG review panel within Germany's excellence strategy selection process.

Marc Schoenauer Member, Villani Mission on Artificial Intelligence [50] (see also the AIforHumanity Web Site); Conseil scientifique, MoveInSalcay platform, coordinated by Nokia-Bell Labs; Comité Scientifique IA, SCube (Scientipôle Savoirs & Société), Orsay; Scientific Committee, TrackML (see Section 7.6); Comité de sélection, Chaire ABEONA-ENS "Biais et Equité en IA"; Conseil Scientifique, Fondation de Recherche pour l'Aéronautique et l'Espace (FRAE).

Michèle Sebag Jury de sélection, LRI; ENS-Lyon; LIX-Ecole Polytechnique; LORIA; Univ. Dortmund; Univ. Liège. Evaluation NSERC, Canada.

10.1.7. Research Administration

Cécile Germain University officer for scientific computing; member of the Board of the Lidex *Center for Data Science*; member of the scientific council of faculty of Medicine (UPsud).

Isabelle Guyon Representative of UPSud in the DataIA *Institut de Convergence* Program Committee, University of Paris-Saclay.

Marc Schoenauer Deputy Scientific Director of Inria (in French, Directeur Scientifique Adjoint, DSA), in charge of AI.

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 of Univ. Paris-Saclay; member of the Scientific Council of Labex AMIES, Applications des Mathématiques ds l'Industrie, l'Entreprise et la Société; member of the Scientific Council of IRT System'X; member of the CSFRS (Conseil supérieur de la formation et de la recherche stratégique).

Paola Tubaro Representative of CNRS in the DataIA *Institut de Convergence* Program Committee, University of Paris-Saclay; member of the Board, Maison des Sciences de l'Homme Paris-Saclay.

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, 26h, L2, Univ. Paris-Sud.

Licence : Aurélien Decelle, Introdution to Machine Learning, 57h, L2, Univ. Paris-Sud.

Licence : Aurélien Decelle, Object-oriented programming , 26h, L2, Univ. Paris-Sud.

Licence : Aurélien Decelle, Computer Architecture, 26h, L3, Univ. Paris-Sud.

Licence : François Landes, Mathematics for Computer Scientists, 51h, L2, Univ. Paris-Sud.

Licence : François Landes, Machine Learning and Artificial Life, 48h, L2, Univ. Paris-Sud.

Licence and Polytech : Cécile Germain, Computer Architecture

Licence : Isabelle Guyon, Project: Resolution of mini-challenges (created by M2 students), L2, Univ. Paris-Sud.

Master : François Landes, Machine Learning, 22h, M1 Polytech, U. Paris-sud.

Master : Guillaume Charpiat and Victor Berger, Advanced Machine Learning, 34h, M2 Recherche, Centrale-Supélec.

Master : Guillaume Charpiat, Introduction to Deep Learning, 6h, M2 Recherche, Telecom.

Master : Aurélien Decelle, Machine Learning, 26h, M1, Univ. Paris-Sud.

Master : Aurélien Decelle, Probability and statistics, 26h, M1, Univ. Paris-Sud.

Master : Cécile Germain, Parallel Programming

Master : Isabelle Guyon, Project: Creation of mini-challenges, M2, Univ. Paris-Sud.

Master : Michèle Sebag, Machine Learning, 12h; Deep Learning, 9h; Reinforcement Learning, 12h; M2 Recherche, U. Paris-sud. Summer School Deep Learning, Genova (Italy), 5h.

Master : François Landes, Machine Learning, 9h, M2 Recherche, U. Paris-sud.

Master : Paola Tubaro, Start -up project for engineering students, 24h, Telecom ParisTech.

Master : Paola Tubaro, Sociology of social networks, 24h, M2, EHESS/ENS.

Master : Flora Jay, Population Genetics, 10h, M2, Univ. Paris-Sud.

Doctorate: Paola Tubaro, Research Methods, 12h, University of Insubria, Italy.

10.2.2. Supervision

PhD François GONARD, *Cold-start recommendation : from Algorithm Portfolios to Job Applicant Matching*, Université Paris-Saclay, May 2018

PhD Thomas SCHMITT, *Collaborative Matching of Job Openings and Job Seekers*, Université Paris-Saclay, June 2018

PhD 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*, Paola Tubaro, with M. Ugur and S. Gorgoni, University of Greenwich, London, UK, Oct. 2018.

PhD in progress Eléonore BARTENLIAN, *Deep Learning pour le traitement du signal*, 1/10/2018, Michèle Sebag and Frédéric Pascal (Centrale-Supélec)

PhD in progress Victor BERGER, *Variational Anytime Simulator*, 1/10/2017, Michèle Sebag

PhD in progress Leonard BLIER, *Vers une architecture stable pour les systèmes d'apprentissage par renforcement*, 1/09/2018, Yann Ollivier (Facebook AI Research, Paris) and Marc Schoenauer

PhD in progress Tony BONNAIRE, *Reconstruction de la toile cosmique*, from 1/10/2018, Nabila Aghanim (Institut d'Astrophysique Spatiale) and Aurélien Decelle

PhD in progress Benjamin DONNOT, *Optimisation et méthodes d'apprentissage pour une conduite robuste et efficace du réseau électrique par anticipation sur base de parades topologiques.*, 1/09/2015, Isabelle Guyon and Antoine Marot (RTE)

PhD in progress Balthazar DONON, *Apprentissage par renforcement pour une conduite stratégique du système électrique*, 1/10/2018, Isabelle Guyon and Antoine Marot (RTE)

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 Loris FELARDOS, *Neural networks for molecular dynamics simulations*, 1/10/2018, Guillaume Charpiat, Jérôme Hénin (IBPC) and Bruno Raffin (InriAlpes)

PhD in progress Giancarlo FISSORE, *Statistical physics analysis of generative models*, 1/10/2017, Aurélien Decelle and Cyril Furtlehner

PhD in progress Julien GIRARD, *Vérification et validation des techniques d'apprentissage automatique*, 1/10/2018, Zakarian Chihani (CEA) and Guillaume Charpiat

PhD in progress Diviyan KALAINATHAN, *Causal models and quality of life at work*, 1/10/2017, Michèle Sebag and Isabelle Guyon

PhD in progress Zhengying LIU, *Automation du design des reseaux de neurones profonds*, 1/10/2017, Isabelle Guyon

PhD in progress Nizam MAKDOUD, *Motivations intrinsèques en apprentissage par renforcement. Application à la recherche de failles de sécurité*, 1/02/2018, Marc Schoenauer and Jérôme Kodjabachian (Thalès ThereSIS, Palaiseau).

PhD in progress Marc NABHAN, *Sûreté de fonctionnement d'un véhicule autonome - évaluation des fausses détections au travers d'un profil de mission réduit*, 1/10/2017, Marc Schoenauer and Hiba Hage (Renault)

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 Herilalaina RAKOTOARISON, *Automatic Algorithm Configuration for Power Grid Optimization*, 1/10/2017, Marc Schoenauer and Michèle Sebag

PhD in progress Théophile SANCHEZ, *Reconstructing the past: deep learning for population genetics*, 1/10/2017, Guillaume Charpiat and Flora Jay

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 Marion ULLMO, *Detection et classification de la toile et des filaments cosmiques*, from 1/10/2018, Nabila Aghanim (Institut d'Astrophysique Spatiale) and Aurélien Decelle

PhD in progress Pierre WOLINSKI, *Learning the Architecture of Neural Networks*, 1/9/2016, Yann Ollivier (Facebook AI Research, Paris) and Guillaume Charpiat

10.2.3. Juries

- Guillaume Charpiat As a member of the "Commission Scientifique" of Inria Saclay: selection committee for post-docs and PhD students hiring; jury of the Gilles Khan PhD prize (SIF); jury for a "Maître de conférence" position at Université Paris-Sud.
- Cécile Germain PhD jury for Mehdi Cherti 26/01/18, Wenjie ZHENG, 13/06/2018; jury of the Telecom PhD prize 23/03/2018
- Isabelle Guyon PhD jury for Giorgos Borboudakis, 21 Nov. 2018, University of Crete, Heraklion, Greece; Master thesis jury for Marvin Lerousseau, 28 June 2018, INP Grenoble; Master thesis jury for Adrien Pavao, 5 Sep. 2018, U.P-Sud, Orsay.
- Michèle Sebag PhD reviewer: Antonio Vergari (Univ. Bari, Italy); Gaétant Hadjeres, LIX, Ecole Polytechnique; Romain Warlop, Univ. Lille. Pdt Jury: Hafiz Tiomoko, Centrale-Supélec; Stanislas Chambon, Telecom.
- Marc Schoenauer PhD jury for Wen SUN, Université d'Angers, 29/11/2018;
- Paola Tubaro PhD jury for Victorien Barbet, Aix-Marseille Université, 13/12/2018.

10.3. Popularization

10.3.1. Articles and contents

Isabelle Guyon

- Pionnière : Isabelle Guyon, professeur à l'université de Paris-Saclay, 7 Feb. 2018, Usine Nouvelle

- Isabelle Guyon veut démocratiser l'intelligence artificielle, Apr. 2018, Le Monde
- Portrait : Isabelle Guyon, sélectionneuse d'algorithmes, 16 May 2018, Industries et Technologie

Paola Tubaro *Notre vie privée, un concept négociable* [52], Antonio Casilli and Paola Tubaro, in *Le Monde*, Jan. 2018.

10.3.2. Interventions

Guillaume Charpiat Séminaire d'Actualité Critique, *L'intelligence artificielle, entre fantasmes et recherche*, ENS Paris, 5 Apr. 2018.

Isabelle Guyon *Codalab, createur de defis*, UniThe ou Café, Inria Saclay, 5 Apr. 2018

Marc Schoenauer

- Congrès Européen Ethique et Gouvernance 2018, OCDE, Paris, 30 Mar. 2018;
- Audition publique sur l'Intelligence Artificielle et le travail, Comité économique et social européen (CESE), Bruxelles, 30 May 2018;
- Public debate with Jean-Marc David, Convention Systematic, 5 Jun. 2018; Conférence Legrain, ENS Paris, 5 Jul. 2018;
- Prix Design et Science de l'Université Paris-Saclay, 11 Oct. 2018.

Michèle Sebag Usine Nouvelle; Podcast Science et Avenir, discussion avec Cédric Villani.

CQFD Project-Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Selection

9.1.1.1. Chair of Conference Program Committees

F. Dufour is the chair of the Program Committee of the SIAM Conference on Control and Its Applications (CT19) in Pittsburgh, USA, 2019.

9.1.1.2. Member of the Conference Program Committees

J. Anselmi has been a member of the technical program committee of the following international conference VALUETOOLS 2018.

9.1.2. Journal

9.1.2.1. Member of the Editorial Boards

P. Del Moral is an associate editor for the journal Stochastic Analysis and Applications since 2001.

P. Del Moral is an associate editor for the journal Revista de Matematica: Teoria y aplicaciones since 2009.

P. Del Moral is an associate editor for the journal Applied Mathematics and Optimization since 2009.

F. Dufour is corresponding editor of the SIAM Journal of Control and Optimization since 2018. F. Dufour is associate editor of the journal Applied Mathematics & Optimization (AMO) since 2018. F. Dufour is associate editor of the journal Stochastics: An International Journal of Probability and Stochastic Processes since 2018.

F. Dufour is the representative of the SIAM activity group in control and system theory for the journal SIAM News since 2014.

J. Saracco is an associate editor of the journal Case Studies in Business, Industry and Government Statistics (CSBIGS) since 2006.

9.1.2.2. Reviewer - Reviewing Activities

All the members of CQFD are regular reviewers for several international journals and conferences in applied probability, statistics and operations research.

9.1.3. Invited Talks

In March 2018, Jonatha Anselmi was invited to give a talk on load balancing for parallel systems at the Inria team Polaris (Grenoble).

François Dufour was invited to give a talk during the IMA Conference on Stochastic Control, Computational Methods, and Applications at University of Minnesota, May 2018.

François Dufour was invited to give a talk during the Symposium on Optimal Stopping, Rice University, Houston, Texas, June 2018.

9.1.4. Scientific Expertise

J. Saracco is elected member of the council of the *Société Française de Statistique* (SFdS, French Statistical Society).

9.1.5. Research Administration

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 and Pierrick Legrand are members of the council of the Institut de Mathématique de Bordeaux.

F. Dufour has been the coordinator for the Inria evaluation of the theme "Stochastic Approaches"

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

- Licence : J. Anselmi, Probabilités et statistiques, 20 heures, L3, Institut Polytechnique de Bordeaux, école ENSEIRB-MATMECA, filière Télécommunications, France.
- Licence : J. Anselmi, Probabilités et statistiques, 16 heures, L3, Institut Polytechnique de Bordeaux, école ENSEIRB-MATMECA, filière Electronique, France.
- Licence : J. Anselmi, Probabilités et statistiques, 48 heures, niveau L3, Institut Polytechnique de Bordeaux, école ENSEIRB-MATMECA, filière Mathématique et Mécanique, France.
- Licence : F. Dufour, Probabilités et statistiques, 70h, first year of école ENSEIRB-MATMECA, Institut Polytechnique de Bordeaux, France.
- Master : F. Dufour, Méthodes numériques pour la fiabilité, 36h, third year of école ENSEIRB-MATMECA, Institut Polytechnique de Bordeaux, France.

9.2.2. Supervision

- PhD completed : 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 in October 2018).
- PhD in progress : Tiffany Cherchi, “Automated optimal fleet management policy for airborne equipment”, Montpellier University, since 2017, supervised by B. De Saporta and F. Dufour.

MATHRISK Project-Team

10. Dissemination

10.1. Promoting Scientific Activities

10.1.1. Scientific Events Organisation

10.1.1.1. Member of the Organizing Committees

- A. Alfonsi:

  Co-organizer of the working group seminar of MathRisk “Méthodes stochastiques et finance”.
- A. Sulem

  Co-organizer of the seminar Inria-MathRisk /Université Paris 7 LPMA “Numerical probability and mathematical finance”. https://www.lpsm.paris/mathfipronum/gt

10.1.2. Journal

10.1.2.1. Member of the Editorial Boards

- B. Jourdain

  Associate editor of
  - ESAIM : Proceedings and Surveys
  - Stochastic Processes and their Applications (SPA)
- D. Lamberton

  Associate editor of
  - Mathematical Finance,
  - Associate editor of ESAIM Probability & Statistics
- A. Sulem

  Associate editor of
  - Journal of Mathematical Analysis and Applications (JMAA)
  - International Journal of Stochastic Analysis (IJSA)
  - SIAM Journal on Financial Mathematics (SIFIN)

10.1.2.2. Reviewer - Reviewing Activities

- B. Jourdain : Reviewer for *Mathematical Reviews*
- A. Sulem: Reviewer for *Mathematical Reviews*

10.1.3. Invited Talks

- A. Alfonsi
  - 15th of December 2017: "Sampling of probability measures in the convex order and approximation of Martingale Optimal Transport problems." Séminaire Bachelier, Paris.
  - 12th of June 2018: "Sampling of probability measures in the convex order and approximation of Martingale Optimal Transport problems." Conference on Stochastic modeling and financial applications, Verona.
  - 29th and 30th of August 2018: "Introduction to affine processes". Lecture given at the 11th European Summer School in Financial Mathematics, Palaiseau.

  - 29th of October 2018: "Sampling of probability measures in the convex order and approximation of Martingale Optimal Transport problems." International Conference on Control, Games and Stochastic Analysis, Hammamet.
  - 7th of December 2018: "Approximation de mesures de probabilité dans l'ordre convexe par projections pour la distance de Wasserstein." Séminaire de Mathématiques Appliquées, Collège de France.
- V. Bally
  - Conference SPA (Stochastic Processes and their Applications): "Abstract Malliavin calculus and invariance principles", 11-15 June 2018, Gothenburg, Sweden.
  - Workshop on Analytical Aspects of Stochastic Systems: "Transfer of regularity for Markov semigroups", Växjö, Sweden, June 6-8, 2018.
  - Workshop Recent Advances in Random Processes - Conference in honor of Paolo Baldi's 70th aniversary. Talk: Malliavin Calculus and Invariance Principles"
  - Workshop on Asymptotic expansions and Malliavin calculus 15-16 November 2018, Institut Henri Poincaré. Talk: Malliavin Calculus and Invariance Principles"
- B. Jourdain

  - Inria Mathrisk/LPSM university Paris Diderot seminar, 20 December 2018 : Differentiability of the squared quadratic Wasserstein distance

  - 1st Moscow-UK workshop on stochastic analysis : Wasserstein calculus and related topics, ICMS Edinburgh 19-23 November 2018 : Lifted and geometric differentiability of the squared quadratic Wasserstein distance

  - Seminar of the chair Financial Risks, IHP, 5 October 2018 : A new family of one-dimensional martingales couplings

  - Populations : Interaction and Evolution, IHP, 10-14 September 2018 : Existence of a calibrated regime-switching local volatility model

  - Journées MAS 2018, Dijon, 29-31 August : plenary talk entitled Sampling of probability measures in the convex order and approximation of martingale optimal transport problems

  - 10th world congress of the Bachelier finance society, Dublin, 16-20 July 2018 : Sampling of probability measures in the convex order and approximation of martingale optimal transport problems

  - MCQMC2018, Rennes, 2-6 July 2018 : Sampling of probability measures in the convex order and approximation of martingale optimal transport problems

  - Bachelier course : Systems of rank-based diffusions with mean-field interaction, 4 hours, 23 and 30 March 2018
- D. Lamberton

  Invited speaker: Symposium on optimal stopping, June 25-29 2018, Rice University, Houston. (USA)
- A. Sulem
  - Conference SPA (Stochastic Processes and their Applications): "Stochastic Optimal Control Under Partial Observations", 11-15 June 2018, Gothenburg, Sweden.

10.1.4. Research Administration

- A. Alfonsi

  - Deputy director of CERMICS laboratory

  - In charge of the Master "Finance and Application" at the Ecole des Ponts.
- D. Lamberton

  Vice-president for research at Université Paris-Est Marne-la-Vallée

- B. Jourdain

  - Head of the doctoral school MSTIC, University Paris-Est

- A. Sulem

  - Member of the Committee for scientific positions (Commission des emplois scientifiques), Inria Paris

  - Corresponding member of the comité opérationel d'évaluation des risques légaux et éthiques (COERLE) at Inria Paris research center

  - Member of the Committee for Inria international Chairs

10.2. Teaching - Supervision - Juries

10.2.1. Teaching

Licence :

- A. Alfonsi: 'Probabilités", first year course at Ecole des Ponts.

- V. Bally : "Analyse Hilbertienne", Course L3, UPEMLV

Master :

- A. Alfonsi:
  - "Données Haute Fréquence en finance",Master lectures at UPEMLV.
  - 'Traitement des données de marché : aspects statistiques et calibration", Master lectures at UPEMLV.
  - "Mesures de risque", Master course of UPEMLV and Paris VI.
  - Professeur chargé de cours at Ecole Polytechnique.
- V. Bally
  - Course on "Taux d'Intêret", M2 Finance, UPEMLV
  - Course on "Calcul de Malliavin et applications en finance", M2 Finance, UPEMLV
  - Course on "Analyse du risque", M2 Actuariat, UPEMLV
  - Course on "Processus Stochastiques", M2 Recherche, UPEMLV
- B. Jourdain
  - Course on "Mont-Carlo Markov chain methods and particle algorithms", Research Master Probabilités et Modèles Aléatoires, Sorbonne Université
  - B. Jourdain: course "Mathematical finance", M1, ENPC
- B. Jourdain, B. Lapeyre
  - Course "Monte-Carlo methods", 3rd year ENPC and Master Recherche Mathématiques et Application, University of Marne-la-Vallée
- J.-F. Delmas, B.Jourdain
  - course "Jump processes with applications to energy markets", 3rd year ENPC and Master Recherche Mathématiques et Application, University of Marne-la-Vallée
- B. Lapeyre
  - Monte-Carlo methods in quantitative finance, Master of Mathematics, University of Luxembourg,
- D. Lamberton
  - Calcul stochastique pour la finance, master 1 course, Université Paris-Est Marne-la-Vallée
- 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), 27 h.
- "PDE methods in Finance", Master of Mathematics, University of Luxembourg, 22 h lectures and responsible of the module "Numerical Methods in Finance".

10.2.2. Supervision

PhD Alexandre Zhou, "Theoretical and numerical study of problems nonlinear in the sense of McKean in finance", Ecole des Ponts, defended on October 17th 2018, supervised by B.Jourdain.

PhD Giulia Terenzi, "American options in complex financial models", université Marne la Vallée, defended on December 17th 2018, supervised by D. Lamberton and Lucia Caramellino, University Tor Vergata, Rome.

PhD Marouan Iben Taarit , " On CVA and XVA computations ", "Valorisation des ajustements Xva : de l'exposition espérée aux risques adverses de corrélation", CIFRE Natixis/ENPC, defended on January 8th, ENPC, Supervisor: Bernard Lapeyre.

PhD in progress :

- Anas Bentaleb (started February 2018) : Mathematical techniques for expected exposure evaluation, Supervisor: B. Lapeyre.

- Adel Cherchali, "Numerical methods for the ALM", funded by Fondation AXA, starting from September 2017, Supervisor: A. Alfonsi

- Rafaël Coyaud, "Deterministic ans stochastic numerical methods for multimarginal and martingale constraint optimal transport problems", starting from October 2017, Supervisor: A. Alfonsi

- 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.

- Sophian Mehalla (started November 2017), CIFRE agreement Milliman company/Ecole des Ponts (http://fr.milliman.com, Supervisor: B. Lapeyre

- Oumaima Bencheikh (started November 2017) "Acceleration of probabilistic particle methods", Supervisor: B. Jourdain

- Ezechiel Kahn (started September 2018) "Functional inequalities for random matrices models", supervised by B. Jourdain and D. Chafai

- William Margheriti (started January 2018) "Numerical methods for martingale optimal transport problems", supervised by J.-F. Delmas and B. Jourdain

10.2.3. Juries

B. Jourdain :

Jury and report on

- PhD of Hadrien De March, defended on June 29, university Paris Saclay
- PhD of David Krief, defended on September 27, University Paris Diderot

A. Sulem

- PhD of David Krief, defended on September 27, University Paris Diderot (Chair of the Committee)
- PhD of Xiao Wei, November 27, University Paris Diderot
- PhD Hadjer Moussaoui, December 14, Université de Toulon
- HdR of Thomas Lim, ENSIIE, December 4, Université Evry Val d'Essonne
- PEDR CNRS September 2018
- PRIX Inria : Grand Prix Inria - Académie des Sciences; - Prix Jeune Chercheur - Académie des Sciences ; Prix Innovation - Dassault Système (Spring 2018)

SIMSMART Team

9. Dissemination

9.1. Promoting Scientific Activities

9.1.1. Scientific Events Organisation

9.1.1.1. General Chair, Scientific Chair

- F. Cérou and M. Rousset have been the main organizer and scientific manager of the Workshop Simulation and probability: recent trends (5-8 June, Rennes) within the Thematic Semester 2018 of Labex Lebesgue.
- V.Monbet has organized a Workshop in Rennes "Fonctional Data Analysis 2018", Oct. 24-26, 2018, https://perso.univ-rennes1.fr/valerie.monbet/FDA2018/PEPS_FDA2018_Workshop.html.
- V.Monbet has organized a Workshop in Rennes on Statistics in Meteorology, Nov. 28-30 2018, https://spatiotempmeteo.sciencesconf.org/.

9.1.1.2. Member of the Organizing Committees

Cédric Herzet was part of the Conference Program Committee of the iTwist'18 Workshop

9.2. Teaching - Supervision - Juries

9.2.1. Teaching

François Le Gland has given

- 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 electronical engineering and telecommunications,
- and a 3rd year course on hidden Markov models, at Télécom Bretagne, aka IMT Atlantique, Brest.

Cédric Herzet has given

- a Master course at INSA Rennes, option Génie Mathématique, cours de Parcimonie en traitement du signal et des images.
- a Master course at Ensai Rennes, Master international "Smart Data" , cours "Foundations of Smart Sensing".

9.2.2. PhDs of the team members

- Defended PhD: Kersane Zoubert–Ousseni, CEA LETI, Grenoble. Subject: Off–line indoor navigation [1], supported by a CEA grant, with Christophe Villien (CEA LETI, Grenoble) as co-advisor. From Dec 2014 to Apr 2018. This PhD is related to our applicative/transfer activity on filtering.
- In progress: Thi Tuyet Trang Chau, IRMAR Rennes 1 University. Subject: new statistical methods for missing-data imputation and non-parametric state-space modeling, supported by Labex Lebesgue and Brittany Council, with Pierre Ailliot (UBO) as co-advisor. Since Oct 2015. This PhD is related to Objective 3.
- In progress: Audrey Cuillery, Inria rennes. Subject: Bayesian tracking from raw data, supported by a CIFRE grant from Naval Group (DCNS) Research, with Dann Laneuville (Naval Group) as co-advisor. Since May 2016. This PhD is related to our applicative/transfer activity on filtering.
- In progress: Audrey Poterie, IRMAR and INSA Rennes. Subject: extension of learning methods to grouped variables, supported by a French Research Ministry grant, with Jean-François Dupuy (INSA) and Laurent Rouvière (Rennes 2) as co-advisors. Since Oct 2015. This PhD is related to Objective 3.
- In progress: Yushun Xu, LAMA, Paris-Est University. Subject: Variance reduction and Langevin processes, supported by a French Research Ministry grant, with Pierre-André Zitt (LAMA) as a co-advisor. Since Sept 2015. This PhD is related to Objective 1 and Application 1.
- Starting: Gabriel Jouan, IRMAR, Rennes. Subject: parametric and non-parametric weather forecast corrections from catalogs of weather data records, supported by a CIFRE grant of Scalian Alyotech, with Soulvan Monnier (Scalian Alyothech) as co–advisor. Starting 2018. This PhD is related to our applicative/transfer activity, as well as to Objective 2 and Objective 3.

C. Herzet is the co-supervisor of two PhDs, one with Frédéric Champagnat (Onera, Palaiseau), and one with Charles Vanwynsberghe (ENSTA Bretagne) and Alexandre Baussard (IUT de Troyes).

9.2.3. Juries

- François Le Gland has been a member of the PhD defense committee of Nicolas Merlinge (université Paris Sud and Coventry University, advisers : Hélène Piet–Lahanier and James Brusey).
- Cédric Herzet has been a member of the PhD defense committee of Quentin Denoyelle, « Theoretical and Numerical Analysis of Super-Resolution without Grid », Paris-Dauphine, Thesis director : Gabriel Peyré.

TOSCA Project-Team

8. Dissemination

8.1. Promoting Scientific Activities

8.1.1. Promotion of Mathematics in the industry

- A. Lejay is member of the board of AMIES (Agence Mathématiques en Intéractions avec l'Entreprise et la Société).
- 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.
- 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.

8.1.2. Scientific Events Organisation

8.1.2.1. General Chair, Scientific Chair

- Etienne Tanré was the General Chair of the Fourth International Conference on Mathematical Neuroscience https://icmns2018.inria.fr/, held in Antibes-Juan les Pins, June 11-13 2018.

8.1.2.2. Member of the Organizing Committees

- M. Bossy was a co-organizer of the workshop on Wasserstein calculus and related topics, ICMS, Edinburgh, UK- 19 to 23 November 2018.
- C. Fritsch co-organizes with Marianne Clausel (Univ. de Lorraine) the weekly Seminar of Probability and Statistics of IECL, Nancy.
- C. Fritsch co-organized the Ada Lovelace Day held at Inria Nancy – Grand Est, October 9.

8.1.3. Scientific Events Selection

8.1.3.1. Member of the Conference Program Committees

- M. Bossy is member of the SMAI2019 Conference Scientific Committee.
- D. Talay is serving as a member of the "Perturbation Techniques in Stochastic Analysis and Its Applications" Conference Program Committee (Luminy, France, 2019).

8.1.4. Journal

8.1.4.1. Member of the Editorial Boards

- N. Champagnat serves as an associate editor of *Stochastic Models*.
- N. Champagnat serves as co-editor-in-chief with Béatrice Laurent-Bonneau (IMT Toulouse) of *ESAIM: Probability & Statistics*.
- A. Lejay is one of the three editors of the *Séminaire de Probabilités* and *Mathematics and Computers in Simulation* (MATCOM).
- D. Talay served as an Area Editor of *Stochastic Processes and their Applications*, and as an Associate Editor of *Probability, Uncertainty and Quantitative Risk*, *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 Co-editor in chief of *MathematicS in Action*.

8.1.4.2. Reviewer - Reviewing Activities

- N. Champagnat wrote reviews for *Annales de l'Institut Fourier*, *The Annals of Applied Probability* (three times this year), *Stochastic Processes and Their Applications*, *Electronic Journal of Probability* and *Frontiers of Mathematics in China*.
- C. Fritsch wrote reviews for *Applied Mathematics and Computation* and *PLOS ONE*.
- A. Lejay wrote reviews for *Proceedings of the Royal Society A*, *Mathematics and Computers in Simulation*, *Journal of Theoretical probability*, *Stochastic Processes and their Applications*, *Journal of computational physics*, *Journal of Functional Analysis*, *Electronic Journal of Probability*, *Journal of Optimization theory and applications*, *Physical Review E*, *Potential Analysis*, *Annals of Applied Probability*, *Annales de l'IHP, probabilités et statistique* and *Acta Mathematica Scientia*.
- D. Talay reported on applications to the Swiss National Science Foundation (SNSF).
- D. Talay reported on applications to the Research Grants Council (RGC) of Hong Kong.
- E. Tanré wrote reviews for *Annales Henri Lebesgue*, *The Annals of Applied Probability*, *Mathematics, MDPI*
- E. Tanré serves has a permanent reviewer of *Mathematical Reviews of the American Mathematical Society (MathSciNet)*.
- D. Villemonais wrote reviews for *Comptes-Rendus de l'Académie des Sciences de Paris*, *Journal of Advanced Probability*, *Electronic Journal of Probability*, *ESAIM: Probability & Statistics*, *Stochastic processes and applications*, *Markov Processes and Related Fields*, *The Annals of Applied Probability*.

8.1.5. Invited Talks

- N. Champagnat has been invited to give talks at the conference of *ANR NONLOCAL* in Chambéry in March, at the *Conference on Probability and Biological Evolution* at CIRM, Luminy in June, at *Journée mathématiques et informatique pour l'analyse des données et imagerie en oncologie* of the Cancéropôle Est at Institut de Cancérologie de Lorraine, Nancy in June, at the *MCQMC 2018* conference in Rennes in July, at the *Conference on Advances in Statistical Mechanics* at CIRM, Luminy in August, at the conference *Populations: Interactions and Evolution* at IHP, Paris in September and at the *ICMS workshop on Wasserstein calculus and related topics* at Bayes Center, Edinburgh in November.
- N. Champagnat has been invited to give a seminar talk at the *Groupe de travail PEIPS* at École Polytechnique in Palaiseau in February.
- N. Champagnat gave a colloquium talk at the *Colloquium - Mathematiques à Angers* in Angers in February.
- N. Champagnat has been invited to give a tutorial talk (mini-course) at the *Workshop on Mathematical Modeling with Measures: where Applications, Probability and Determinism Meet* at Lorentz Center, Leiden in December.
- Q. Cormier, P. Helson and E. Soret have presented three posters at the conference *International Conference on Mathematical Neuroscience* in Antibes Juan-les-Pins in June.
- C. Fritsch has been invited to give a plenary talk at the workshop *Modélisation stochastique et analyse en biologie* in Tours in May.
- C. Fritsch has been invited to give a plenary talk at the *third Mathematical Biology Modelling Days of Besançon* in June.
- C. Fritsch gave a talk at the *European Conference on Mathematical and Theoretical Biology* in Lisbonne in July.
- A. Lejay have been invited to give a mini-course "A short introduction to rough paths" in the *Rencontres Mathématiques de Rouen* in June 2018.
- A. Lejay have been invited to give a talk at the workshop *Random graphs and its applications for networks*, Saint-Étienne, October 2018.

- A. Lejay have been invited to give talks at the conference *Stochastics and PDE*, in Bucarest, September 2018 and at the conference *2th International Vilnius Conference on Probability Theory and Mathematical Statistics and 2018 IMS Annual Meeting on Probability and Statistics*, in Vilnius, June 2018.
- A. Lejay have been invited to give a seminar talk at the Mathematical Institute in Oxford, November 2018.
- E. Soret gave a lecture at the national conference *Journées de Probabilités* in Tours in June.
- D. Talay was an invited speaker at the 'Symposium on Optimal Stopping in Honor of Larry Shepp', Rice University in Houston, Texas, USA, 25-29 June 2018.
- D. Talay was an invited plenary speaker at the 9th International Conference on Stochastic Analysis and its Applications, Bielefeld, Germany, 3-7 September 2018.
- D. Talay was an invited speaker at the 'Wasserstein Calculus and Related Topics' Moscow-UK workshop on Stochastic Analysis, Edinburgh, UK, 19-23 November 2018.
- E. Tanré has given an invited talk at the *12th International Vilnius Conference on Probability Theory and Mathematical Statistics* and *2018 IMS Annual Meeting on Probability and Statistics* in Vilnius in July.
- E. Tanré has been invited to give a seminar talk in Lyon in October.
- M. Tomasevic gave a seminar at CMAP Laboratory, Ecole Polytechnique, France, in March.
- M. Tomasevic gave a lecture at the 'Jps-2018: Jeunes Probabilistes et Statisticiens 2018', Saint–Pierre d'Oléron, France, 13-18 May 2018.
- M. Tomasevic gave a lecture at the national conference *Journées de Probabilités* in Tours in June.
- M. Tomasevic gave a lecture at the 9th International Conference on Stochastic Analysis and its Applications, Bielefeld, Germany, 3-7 September 2018.
- M. Tomasevic gave a lecture at the 'Journée francilienne d'accueil des postdoctorants en mathématiques', Institut H. Poincaré, Paris, France, in October.
- D. Villemonais has been invited to give talks at the *Workshop on Particle systems and PDEs* at Bath University and at the conference *Populations: Interactions and Evolution* at IHP, Paris in September.
- D. Villemonais has been invited to give seminar talks at Warwick University, at the *Probability seminar* of London School of Economics and at the probability seminar of Université Paris-Descartes.

8.1.6. Leadership within the Scientific Community

- M. Bossy is serving as a vice president of the Inria Evaluation Committee.
- A. Lejay is head of the Probability and Statistics team of Institut Élie Cartan de Lorraine.
- 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 served as a member of the committee in charge of preparing the application of Paris to the International Congress of Mathematicians 2022.
- D. Talay is serving as a member of the CMUP Advisory Commission (University of Porto).
- D. Talay is a member of the Comité National Français de Mathématiciens.

8.1.7. Scientific Expertise

- M. Bossy served as a committee member for Pierre Lafitte Prize 2019.
- M. Bossy participated in a Associated Professor position recruitment committee at CMA Mines-ParisTech.
- M. Bossy was member of the hiring committee 26 PR at Université d'Evry.

- C. Fritsch is member of the Ph.D. monitoring committee of Léo Darrigade (INRA).
- D. Talay served as a member of the committee for positions in Applied Mathematics at the Ecole Polytechnique.
- D. Talay served as a member of the HCERES evaluation committees for the LPSM Laboratory (Paris Sorbonne University) and the ENSTA mathematics department.
- D. Talay chaired the 2019 Pionneer ICIAM prize committee.

8.1.8. Research Administration

- N. Champagnat is a member of the *Comité de Centre*, the *COMIPERS* and the *Commission Information Scientifique et Technique* of Inria Nancy - Grand Est, *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 local correspondent of the COERLE (*Comité Opérationel d'Évaluation des Risques Légaux et Éthiques*) for the Inria Research Center of Nancy - Grand Est.
- C. Fritsch is member of the *Commission du Développement Technologique* of Inria Nancy - Grand Est, of the *Commission du personnel* and the *Commission Parité-Égalité* of IECL. She is the local Raweb correspondent for the Inria Research Center of Nancy - Grand Est.
- A. Lejay is member of the Executive board of *LUE Impact project digistrust* (Univ. Lorraine), of the Conseil de Pôle AM2I (Univ. Lorraine) and of the CUMI (Inria NGE).
- D. Villemonais is responsible of the "ingénierie mathématique" cursus of École des Mines de Nancy and is elected member of the conseil de l'École des Mines de Nancy.

8.2. Teaching - Supervision - Juries

8.2.1. Teaching

Master : M. Bossy *Stochastic Particle Methods for PDEs*, 18h, M2 Probabilité et Applications, Université Pierre et Marie Curie, France.

Master: N. Champagnat, *Introduction to Quantitative Finance*, 13.5h, 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, *Problèmes inverses*, 22.5h, M1, École des Mines de Nancy, France.

Master: C. Fritsch, *Introduction to Quantitative Finance*, 3h, M1, École des Mines de Nancy, France.

Master: C. Fritsch, *Probability theory*, 61h, M1, École des Mines de Nancy, France.

Master: C. Fritsch, *Probability theory*, 40h, L3, École des Mines de Nancy, France.

Master: A. Lejay, *Simulation des marchés financiers*, 29h, M2, Master PSA, Université de Lorraine, France.

Master: D. Talay *Invariant measures of diffusion processes*, 18h, M2 Probabilité et Applications, Université Paris 6, France.

Master: E. Tanré (courses and exercices), *Advanced Numerics for Computational Finance*, 30h (20h + 10h), M2, Univ. Côte d'Azur (Mathmods Erasmus Mundus), France.

Master: E. Tanré, *Mathematical Methods for Neurosciences*, 20h, M2, ENS - Master MVA / Paris 6 - Master Maths-Bio, France.

Master: E. Tanré (courses) and M. Tomasevic (practical classes) *Numerical probability for mathematical finance*, 20h (8h + 12h), M2, Univ. Côte d'Azur (Master IMAFA), France.

8.2.2. Supervision

PhD in progress: Alexis Anagnostakis, *Étude du mouvement brownien collant*, Université de Lorraine, Octobre 2018, A. Lejay and D. Villemonais.

PhD: Antoine Brault, *Flots rugueux et inclusions différentielles perturbées*, Université Toulouse 3, Octobre 2018, A. Lejay and L. Coutin (Université Toulouse 3).

PhD in progress: Lorenzo Campana, *Stochastic modeling of non-spherical particles transport and deposition by turbulent flow*, Université Côte d'Azur, December 2017, M. Bossy.

PhD in progress: Quentin Cormier, *Biological Networks of Spiking Neurons*, September 2017, E. Tanré and R. Veltz (MATHNEURO Inria team).

PhD in progress: Vincent Hass, *Individual-based models in adaptive dynamics and long time evolution under assumptions of rare advantageous mutations*, Université de Lorraine, October 2018, N. Champagnat.

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: Rodolphe Loubaton, *Caractérisation des cibles thérapeutiques dans un programme génique tumoral*, Université de Lorraine, October 2018, N. Champagnat and L. Vallat (CHRU Strasbourg).

PhD: M. Tomasevic, *On a Probabilistic Interpretation of the Keller-Segel Parabolic-Parabolic Equations*, Université Côte d'Azur, November 2018, D. Talay.

8.2.3. Juries

- M. Bossy served as a referee for the Ph.D. theses of Meïssam Bahlali, *Adaptation de la modélisation hybride eulérienne / lagrangienne stochastique de Code Satrne à la dispersion atmosphérique de polluants à l'échelle micro-météorologique et comparaison à la méthode eulérienne* Université Paris-Est, October 19, 2018, and of Alexandre Zhou, *Etude théorique et numérique de problèmes non linéaires au sens de McKean en finance*, Université Paris-Est, October 17, 2018.
- M. Bossy served as an examiner for the Ph.D. thesis of Isaque Santa Brigida Pimentel, *Valorisation optimale asymptotique avec risque asymétrique et applications en finance*, Université Paris Saclay, October 16, 2018.
- M. Bossy served as an examiner for the HDR of Dario Vincenzi, *Dynamique Lagrangienne en Turbulence et Turbulence Elastique*, Université Côte d'Azur, December 14, 2018.
- N. Champagnat served as a referee for the Ph.D. theses of Simon Girel, *Modélisation de la réponse immunitaire T-CD8: Analyse mathématique et modèles multiéchelles*, Univ. Lyon 1, November 13, 2018 and of Paulien Jeunesse, *Analyse statistique autour du taux de mortalité*, Université Paris Dauphine, January 8, 2019.
- N. Champagnat served as an examiner for the Ph.D. thesis of Rim Touibi, *Sur le comportement qualitatif des solutions de certaines équations aux dérivées partielles stochastiques de type parabolique*, Université de Lorraine, December 8, 2018.
- A. Lejay served as an examiner for the Ph.D. theses of Rim Touibi, *Sur le comportement qualitatif des solutions de certaines équations aux dérivées partielles stochastiques de type parabolique*, Université de Lorraine, December 8, 2018, of Antoine Brault, *Flots rugueux et inclusions différentielles perturbées*, Université Toulouse 3, October 8, 2018, and of Guillaume Copros, *Convergence of generic infinite products of nonexpansive and uniformly continuous operators*, Université Toulouse 3, October 2018.
- A. Lejay served as an examiner for the Habilitation thesis of Renaud Marty, *Quelques contributions à l'étude et aux applications des processus multifractionnaires et de la longue dépendance*, Université de Lorraine, February 2018.
- D. Talay served as an examiner for the Ph.D. thesis of Xiaoli Wei, *Problèmes de Contrôle de type McKean–Vlasov et Applications*, Université Paris Diderot, December 2018.

- D. Talay served as an examiner for the Habilitation thesis of Guillaume Bernis, *Modélisation Probabiliste des Marchés de Crédit*, université Paris Panthéon Sorbonne, January 2018.
- D. Talay served as an examiner for the Habilitation thesis of Ludovic Goudenège, *Algorithmes Numériques pour des Problèmes Stochastiques*, université Paris Saclay, December 2018.
- D. Talay served as a referee for Ph.D. thesis of Igor Honoré, *Estimations Non Asymptotiques de Mesures Invariantes et Régularisation par un Bruit Dégénéré de Chaînes d'Equations Différentielles Ordinaires*, université Paris Saclay, December 2018.

8.3. Popularization

8.3.1. Interventions

- M. Bossy gave the plenary lecture for the Academic Awards Ceremony of the Olympics of Geosciences and Mathematics 2018.
- Q. Cormier has animated the Inria desk at *Fête de la Science*.
- E. Tanré has presented his researches at *Journées Portes Ouvertes - Inria Sophia-Antipolis*.