

*Inria*

RESEARCH CENTER  
Saclay - Île-de-France

FIELD

Activity Report 2019

# Section Highlights of the Team

Edition: 2020-03-21



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## **COMETE Project-Team**

### **5. Highlights of the Year**

#### **5.1. Highlights of the Year**

Catuscia Palamidessi has received an European Research Council (ERC) grant for the project **HYPATIA**.

**DATASHAPE Project-Team (section vide)**

**DEDUCTEAM Project-Team (section vide)**

**GRACE Project-Team (section vide)**

## MEXICO Project-Team

# 5. Highlights of the Year

## 5.1. Highlights of the Year

### 5.1.1. Awards

- The article *Manifestability Verification of Discrete Event Systems* by Lina Ye, Philippe Dague, and Lulu He received the *Best Paper Award* of the *30th International Workshop on Principles of Diagnosis DX'19*, Klagenfurt/Austria, November 2019.
- The article *Sequential Reprogramming of Boolean Networks Made Practical* by Hugues Mandon, Cui Su, Stefan Haar, Jun Pang, and Loïc Paulevé received the *Best Paper Award* of the conference on *Computational Models in Systems Biology (CMSB 2019)*, Trieste/Italy, September 18-20, 2019.

BEST PAPERS AWARDS :

[24]

L. YE, P. DAGUE, L. HE. *Manifestability Verification of Discrete Event Systems*, in "DX'19 - 30th International Workshop on Principles of Diagnosis", Klagenfurt, Austria, November 2019, vol. 19, p. 1-9, Best Paper Award (<https://dx-workshop.org/2019/awards/>), <https://hal.archives-ouvertes.fr/hal-02425146>

[22]

H. MANDON, C. SU, S. HAAR, J. PANG, L. PAULEVÉ. *Sequential Reprogramming of Boolean Networks Made Practical*, in "CMSB 2019 - 17th International Conference on Computational Methods in Systems Biology", Trieste, France, Lecture Notes in Computer Science, Springer, 2019, vol. 11773, p. 3–19, Best paper award [DOI : 10.1007/978-3-030-31304-3\_1], <https://hal.archives-ouvertes.fr/hal-02178917>



## **PARSIFAL Project-Team**

### **5. Highlights of the Year**

#### **5.1. Highlights of the Year**

- The journal *Mathematical Structures in Computer Science* published “A special issue on structural proof theory, automated reasoning and computation in celebration of Dale Miller’s 60th birthday” – volume 29, Special issue 8, September 2019.
- Accattoli was invited speaker at the international conference FSCD 2019.

**SPECFUN Project-Team (section vide)**

## TOCCATA Project-Team

# 5. Highlights of the Year

## 5.1. Highlights of the Year

- Martin Clochard has been awarded the GDR GPL 2018 prize (<http://gdr-gpl.cnrs.fr/node/361>) for his thesis entitled “Methods and tools for specification and proof of difficult properties of sequential programs” carried out at LRI, under the scientific supervision of Claude Marché and Andrei Paskevich. [57] [43]

Martin Clochard is currently a postdoc at ETH Zurich.

- Jean-Christophe Filliâtre receives the 2019 CAV Award, jointly with Rustan Leino (Amazon Web Services), for the design and development of reusable intermediate verification languages which significantly simplified and accelerated the building of automated deductive verifiers. Jean-Christophe is the initial designer of the Why environment for automated deductive verification, and a leading developer of its successor Why3.

The CAV award is given annually at the CAV conference for fundamental contributions to the field of Computer-Aided Verification. <http://cavconference.org/cav-award>

- Claude Marché received the FIEEC CARNOT 2019 prize for applied research for his collaboration with AdaCore. The award recognizes his collaboration with AdaCore, a computer assisted proof verification company, for applications in the development of critical software for safety and security in the aeronautics, space, air traffic control and rail transportation industries, autonomous vehicles, finance or medical devices. <https://www.instituts-carnot.eu/fr/actualite/prix-fieec-carnot-de-la-recherche-appliquee-trois-chercheurs-recompenses-pour-leurs-partenariats-retd-avec-les-pme>

**CELESTE Project-Team (section vide)**

## **COMMANDS Project-Team**

# **5. Highlights of the Year**

## **5.1. Highlights of the Year**

We have now a strong involvement in the study of mean-field games (MFG) and their application to distributed energy production problems. In the paper [3] we study MFG equilibria with coupling of the agents through a price function (see more in the 'New Results' section). In the framework of the PhD of Pierre Lavigne we currently study discrete-time models with risk-averse agents. Both directions take advantage of the recent recruitment of Laurent Pfeiffer as "chargé de recherche", and of a starting collaboration with Jameson Graber (Baylor University, Texas).

**DEFI Project-Team (section vide)**

**DISCO Project-Team (section vide)**

**GAMMA Project-Team (section vide)**



## **POEMS Project-Team**

### **4. Highlights of the Year**

#### **4.1. Highlights of the Year**

- The POEMS EPI has been officially renewed by Inria on the 1st November 2019.
- Two permanent members of the team, S. Chaillat and S. Fliss, have successfully defended their habilitation theses.
- SACHEMS project led by CEA (where POEMS is involved) has been retained in the call of Ile-de-France Region SESAME 2019. Its purpose is to federate the research in the region in the field of SHM (Structural Health Monitoring), which consists of developing intelligent sensors aimed at detecting and characterizing directly defects in a structure (crack, corrosion, etc.). The SACHEMS project is part of a strategy for pooling equipment with the objective of creating an innovation platform for SHM methods.

## RANDOPT Project-Team

# 5. Highlights of the Year

## 5.1. Highlights of the Year

### 5.1.1. Awards

- Cheikh Touré received the 2nd prize for the student best paper award at the conference EMO 2019 for the paper “On Bi-Objective convex-quadratic problems” by Cheikh Touré, Anne Auger, Dimo Brockhoff, Nikolaus Hansen
- Nikolaus Hansen received the ENUM best paper award at the ACM-GECCO 2019 conference (see <https://gecco-2019.sigev.org/index.html/Best+Paper+Awards>) for the paper “A global Surrogate Assisted CMA-ES”

BEST PAPERS AWARDS :

[6]

C. TOURÉ, A. AUGER, D. BROCKHOFF, N. HANSEN. *On Bi-Objective convex-quadratic problems*, in "10th International Conference on Evolutionary Multi-Criterion Optimization", East Lansing, Michigan, United States, March 2019, <https://arxiv.org/abs/1812.00289> , <https://hal.inria.fr/hal-01942159>

[5]

N. HANSEN. *A Global Surrogate Assisted CMA-ES*, in "GECCO 2019 - The Genetic and Evolutionary Computation Conference", Prague, Czech Republic, ACM, 2019, p. 664-672 [DOI : 10.1145/3321707.3321842], <https://hal.inria.fr/hal-02143961>

## TAU Project-Team

# 5. Highlights of the Year

## 5.1. Highlights of the Year

### 5.1.1. Awards

- Best Paper Award in Machine Learning at ECML-PKDD 2019 in Würzburg to Guillaume Doquet and Michèle Sebag for their paper *Agnostic feature selection*. See Guillaume's PhD [13] for more details.
- Nacim Belkhir, Winner ACM-GECCO 2019 **BBComp single-objective**, **BBComp two-objective** and **three-objective** tracks. The winning program is a slightly modified version of the one Nacim wrote during his PhD in TAU in 2017 [71], co-supervised by Marc Schoenauer, Johann Dréo and Pierre Savéant (Thalès TRT).

### 5.1.2. Visibility

- Marc Schoenauer, expert seconding Guillaume Klossa, special advisor to European Vice-President Ansip, for the **report *Toward European Media Sovereignty*** giving strategic advice on the opportunities and challenges related to the use artificial intelligence, with a focus on the media sector.

BEST PAPERS AWARDS :

[32]

G. F. DOQUET, M. SEBAG. *Agnostic feature selection*, in "ECML PKDD 2019 - European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases", Würzburg, Germany, September 2019, <https://hal.archives-ouvertes.fr/hal-02436824>

## TROPICAL Project-Team

### 5. Highlights of the Year

#### 5.1. Highlights of the Year

##### 5.1.1. Notable article

The results of the article [45], providing an unexpected counter example to the “continuous analogue of the Hirsch conjecture”, showing that log-barrier interior point methods are not strongly polynomial, have been discussed by Jesus De Loera in his survey of recent advances on Linear Programming, “**Algebraic and Topological Tools in Linear Optimization**”, Notices de l’AMS (volume 66, number 7, 2019, especially pp. 1028-1032.

##### 5.1.2. Awards

Maxime Grangereau (PhD student) has been laureate of the programme “Siebel Scholar 2020”, <https://twitter.com/polytechnique/status/1177111371835695104>

## LIFEWARE Project-Team

### 5. Highlights of the Year

#### 5.1. Highlights of the Year



Figure 1. La Recherche magazine award 2019 ceremony.

- **Creation of a new team at Inria Paris**

At the end of 2019, the Lifeware team gave birth to a new Inria team, called InBio and affiliated to the Inria Paris research centre. So far, InBio was a Pasteur research unit that was hosting a fraction of the members of the Lifeware team on the campus of Institut Pasteur. So in 2020, InBio becomes a new Common Project-Team between Inria Paris and Pasteur Institute. This demonstrates that Inria is actively supporting research in the computational systems biology field.

- **Launching of Inria Exploratory Action GRAM on chemical programming of artificial vesicles**

Chemical reaction networks are a computation paradigm used by natural cells to process information, take decisions and control their vital processes. The synthesis of artificial vesicles without DNA nor RNA but containing precise quantities of enzymes allows us today to implement high-level functions in proto-cells with numerous potential applications in health and the environment. Based on previous work of the Lifeware project-team on chemical analog computation theory and programming, of the CNRS-Alcediag Sys2diag laboratory on the synthesis of biosensors in artificial vesicles, and on the expertise of the Roscoff Biological Station on membrane transporters, we explore an original approach to analog chemical circuit design applied to the programming of high-level functions in chemical analog computers.

##### 5.1.1. Awards

- **Award Ceremony - La Recherche magazine 2019 - Information Sciences**

The ceremony for awards La Recherche magazine 2019 at University Paris-Dauphine was a great occasion to present our article “Strong Turing Completeness of Continuous Chemical Reaction Networks and Compilation of Mixed Analog-Digital Programs” by F. Fages, G. Le Guludec, O. Bournez and A. Pouly, Best Paper award at CMSB 2017, recipient of La Recherche magazine 2019 Award - Information Sciences.

## **M3DISIM Project-Team**

### **4. Highlights of the Year**

#### **4.1. Highlights of the Year**

The team obtained 3 ANR fundings this year: LungManyScale, ODISSE and SIMR.

## **OPIS Project-Team**

### **5. Highlights of the Year**

#### **5.1. Highlights of the Year**

- Our M.Sc. program in Data Sciences and Business Analytics (with ESSEC Business School) was ranked 3<sup>rd</sup> worldwide in the QS World University Rankings.
- E. Chouzenoux was laureate of the ERC Starting Grant MAJORIS (starting date: 01-01-2020).
- M.C. Corbineau received the best poster award at “Journée de rencontre entre entreprises, doctorants et jeunes docteurs” (J-RED) in 2019.

## **PARIETAL Project-Team**

# **5. Highlights of the Year**

## **5.1. Highlights of the Year**

### **5.1.1. Awards**

- November 2019: Académie des sciences / Dassault System / Inria prize awarded to the developers of scikit-learn: Loic Estève, Alexandre Gramfort, Olivier Grisel, Bertrand Thirion and Gael Varoquaux.
- December 2019: Alexandre Gramfort, Bertrand Thirion and Gael Varoquaux are each awarded a *Chaire IA* following a national call.
- December 2019: Carole Lazarus, former PhD student supervised by Philippe Ciuciu got the Prix de la Chancellerie des Universités de Paris 2019 - Section Sciences.



## **XPOP Project-Team**

# **5. Highlights of the Year**

## **5.1. Highlights of the Year**

Version 2.0 of the SPIX software was available in June 2019.

### **5.1.1. Awards**

Geneviève Robin was awarded: “Prix L’Oréal-UNESCO Pour les Femmes et la Science (Jeunes Talents France 2019)”

## TRIBE Project-Team

# 4. Highlights of the Year

## 4.1. Highlights of the Year

### 4.1.1. Awards

Together with his co-authors, Aline Carneiro Viana was awarded: (1) the **best poster award** at the main conference on the scientific analysis of mobile phone datasets (NetMob) in Oxford, UK, Jul. 2019, for the poster on **Complete Trajectory Reconstruction from Sparse Mobile Phone Data** (collaboration with G. Chen, M. Fiore, and C. Sarraute); (2) the **top-six best paper award** at the 27th International Conference on Advances in Geographic Information Systems 2019 (ACM SIGSPATIAL), in Chicago, USA, Nov. 2019, for the paper on **Deciphering Predictability Limits in Human Mobility**.

### 4.1.2. RIOT Summit 2019

We successfully organized in September 2019 the fourth RIOT Summit, in Helsinki. The RIOT Summit 2019 gathered ~100 enthusiastic industrial participants, makers and academics involved in RIOT. Highlights included a keynote from IoT expert and former IETF general chair Jari Arkko (Ericsson Research), and a new car-sharing product using RIOT announced by Continental (and now deployed on thousands of vehicles). Aside of big companies and academics, a number of SMEs and startups from various places in Europe gave talks on aspects of IoT communication, use cases IoT hardware, IoT open source community aspects and concepts for future IoT software and networks, as well as hands-on sessions and tutorials. See: <http://summit.riot-os.org>.

### 4.1.3. Associated team - EMBRACE

2019 was the third and last year of the EMBRACE Associated team. The EMBRACE (IEveraging huMan Behavior for Resource AlloCation and services orchestration modElS) team was composed by members of the INFINE and by three Brazilian teams from three different Brazilian Universities. The EMBRACE project addressed the topic of designing efficient solutions for 5G networks taking into account human behavior, uncertainty, and heterogeneity of networking resources. A proposal requesting the extension of the project was submitted in Nov. 2019.

More information is available here: <https://team.inria.fr/embrace/>.

### 4.1.4. IETF Hackathons

Concerning Internet Standardization, we contributed to all three IETF Hackathons in 2019. In particular, Oumaima Attia and Cedric Adjih were some major contributors (with many others including Vincent Roca, EPI Privatics) in the NWCRG Hackathon which allowed to release in first prototype of SWIF-codec, a sliding-window forward-error correction codec, see: <https://github.com/irtf-nwcr/swif-codec>. Cedric Adjih is also a major contributor to the LPWAN Hackathon on the SCHC protocol (IPv6 compression for IoT networks), which resulted this year in code at <https://github.com/openshc/openshc>, a working prototype of the protocol.

## AVIZ Project-Team

# 5. Highlights of the Year

## 5.1. Highlights of the Year

- Aviz researchers contributed 36 publications this year. Amongst these 3 papers were presented at IEEE VIS, the largest international Visualization and Visual Analytics conference.
- Aviz researchers remained active in the research community. We organized one Dagstuhl seminar and one Shonan seminar, served in 8 different organizing committee roles, on 19 program committees, and on 5 different journal editorial board. We reviewed for 25 different conference venues and for 12 different journals. We also gave 26 invited talks and served on two different steering committees and a best PhD award committee and served on 10 different juries (for both PhD and Master students).
- Aviz researchers started two four-year ANR grants as principle investigators.

### 5.1.1. Awards

- Tobias Isenberg was named the Associate Editor of the Year for Elsevier Computers & Graphic.
- Pierre Dragicevic and his co-authors received a best paper award at ACM CHI .
- Natkamon Tovanich and his co-authors received the Honorable Mention poster award at EuroVis 2019 .

BEST PAPERS AWARDS :

[34]

P. DRAGICEVIC, Y. JANSEN, A. SARMA, M. KAY, F. CHEVALIER. *Increasing the Transparency of Research Papers with Explorable Multiverse Analyses*, in "CHI 2019 - The ACM CHI Conference on Human Factors in Computing Systems", Glasgow, United Kingdom, May 2019 [DOI : 10.1145/3290605.3300295], <https://hal.inria.fr/hal-01976951>

[51]

N. TOVANICH, N. HEULOT, J.-D. FEKETE, P. ISENBERG. *A Systematic Review of Online Bitcoin Visualizations*, 2019, Posters of the European Conference on Visualization (EuroVis), The poster received the Honorable Mention award at EuroVis 2019 [DOI : 10.2312/EURP.20191148], <https://hal.archives-ouvertes.fr/hal-02155171>

## CEDAR Project-Team

# 5. Highlights of the Year

## 5.1. Highlights of the Year

- Through 2019 competitive **hiring**, the team has doubled its number of senior members: Oana Bălălaşu has been hired on an Inria Starting Researcher Position (SRP), and she joined in november; Angelos Anadiotis has been hired as a Gaspard Monge Assistant Professor at Ecole Polytechnique within the team.
- I. Manolescu and M. Buron have demonstrated the **ConnectionLens** system to the Defense Minister Florence Parly, as part of DataIA's showing for her visit at Inria, in April 2019<sup>0</sup>. The national Inria director Bruno Sportisse, the military director of Ecole polytechnique François Bouchet, and the Fields medalist Cédric Villani were also present.
- As a member of the scientific committee of the **GFAIH** (Global Forum on AI for Humanity), I. Manolescu had the opportunity to meet, in a dinner at the Elysée Palace, and exchange with the French President Emmanuel Macron, the Economy and Industry Minister Bruno Le Maire, the Research Minister Frédérique Vidal, and the Digital Affairs Minister Cedric O<sup>0</sup>.

### 5.1.1. Awards

- The demonstration “Spade: A Modular Framework for Analytical Exploration of RDF Graphs”[15] has obtained the **Best Demonstration Award** at the BDA conference 2019, where it has also been informally presented<sup>0</sup>.

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<sup>0</sup><https://team.inria.fr/cedar/connectionlens/>

<sup>0</sup><https://twitter.com/ioanamanol/status/1189478849651904513>

<sup>0</sup><https://twitter.com/cedarinrialix/status/1185203276142256128>

## **EX-SITU Project-Team**

# **5. Highlights of the Year**

## **5.1. Highlights of the Year**

### **5.1.1. Awards**

- Wanyu Liu: First prize, Télécom ParisTech thesis award, “Information theory as a unified tool for understanding and designing human-computer interaction”
- Stacy Hsueh, Sarah Fdili Alaoui, and Wendy Mackay: Honorable Mention Award at ACM CSCW 2019 for “Deconstructing Creativity: Non-Linear Processes and Fluid Roles in Contemporary Music and Dance.” [21]
- Alexander Eiselmayer, Chat Wacharamanatham, Michel Beaudouin-Lafon, and Wendy Mackay: Best Paper award at ACM CHI 2019 for “Touchstone2: An Interactive Environment for Exploring Trade-offs in HCI Experiment Design” [19]

## ILDA Project-Team

# 5. Highlights of the Year

## 5.1. Highlights of the Year

### 5.1.1. Awards

- Honorable mention for ActiveInk: (Th)Inking with Data at CHI 2019 .
- Best paper and best doctoral student paper awards for Influence of Color and Size of Particles on their Perceived Speed in Node-Link Diagrams at INTERACT 2019 .

BEST PAPERS AWARDS :

[22]

H. ROMAT, N. RICHE, K. HINCKLEY, B. LEE, C. APPERT, E. PIETRIGA, C. COLLINS. *ActiveInk: (Th)Inking with Data*, in "CHI 2019 - The ACM CHI Conference on Human Factors in Computing Systems", Glasgow, United Kingdom, CHI 2019 - Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems, ACM, 2019 [DOI : 10.1145/3290605.3300272], <https://hal.archives-ouvertes.fr/hal-02020272>

[20]

H. ROMAT, D. LEBOUT, E. PIETRIGA, C. APPERT. *Influence of Color and Size of Particles on Their Perceived Speed in Node-Link Diagrams*, in "INTERACT 2019 - 17th IFIP TC 13 International Conference on Human-Computer Interaction", Paphos, Cyprus, Springer, August 2019, p. 619-637 [DOI : 10.1007/978-3-030-29384-0\_37], <https://hal.inria.fr/hal-02274134>

**PETRUS Project-Team (section vide)**