



RESEARCH CENTER

FIELD

**Networks, Systems and Services,
Distributed Computing**

Activity Report 2018

Section Highlights of the Team

Edition: 2019-03-07

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Coast Project-Team

4. Highlights of the Year

4.1. Highlights of the Year

In 2018 we organised in Nancy the 16th European Conference on Computer-Supported Cooperative Work: The International venue on Practice-centred computing and the Design of cooperation technologies (ECSCW 2018).

CTRL-A Project-Team (section vide)

DELYS Team

4. Highlights of the Year

4.1. Highlights of the Year

In 2018, the DELYS team published papers at major conferences in Systems, Distributed Systems, Theoretical Computer Science, Verification, and AI:

- Scheduling under Uncertainty: A Query-based Approach. L. Arantes, E. Bampis, A. Kononov, M. Letsios, G. Lucarelli, P. Sens. IJCAI, [19].
- Byzantine Gathering in Polynomial Time. S. Bouchard, Y. Dieudonné, A. Lamani. ICALP [22].
- The Battle of the Schedulers: FreeBSD ULE vs. Linux CFS. J. Bouron, S. Chevalley, B. Lepers, W. Zwaenepoel, R. Gouicem, J. Lawall, G. Muller, J. Sopena. ATC [24].
- Distributed transactional reads: the strong, the quick, the fresh & the impossible. A. Z. Tomsic, M. Bravo, M. Shapiro. Middleware [31].
- Co-design and verification of an available file system. M. Najafzadeh, M. Shapiro, P. Eugster. VMCAI [28].

MIMOVE Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

- Renata Teixeira was named ACM Distinguished member for outstanding scientific contributions to computing in 2018.
- Our paper “Narrowing the gap between QoS metrics and Web QoE using Above-the-fold metrics” received the Best Dataset Award at the Passive and Active Measurement Conference 2018.

BEST PAPERS AWARDS :

[27]

R. GOMES, G. BOULOUKAKIS, F. COSTA, N. GEORGANTAS, R. DA ROCHA. *QoS-Aware Resource Allocation for Mobile IoT Pub/Sub Systems*, in "2018 International Conference on Internet of Things (ICIOT)", Seattle, United States, June 2018, <https://hal.inria.fr/hal-01797933>

MYRIADS Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

- Best Doctoral Symposium paper award for Clément Elbaz at Foundations and Applications of Self* Systems (FAS* 2018, the event colocating SASO 2018 and ICAC 2018) for the paper entitled “Reactive and Adaptive Security Monitoring in Cloud Computing”

BEST PAPERS AWARDS :

[20]

C. ELBAZ, L. RILLING, C. MORIN. *Reactive and Adaptive Security Monitoring in Cloud Computing*, in "FAS* Doctoral Symposium 2018", Trento, Italy, September 2018, p. 1-3, <https://hal.inria.fr/hal-01884739>

SPIRALS Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

Thomas Durieux, who defended his PhD thesis [11] in September 2018 on automated software repair, has obtained two best paper awards in 2018: at the 29th IEEE International Symposium on Software Reliability Engineering (ISSRE) [26] for his work on self-healing web applications based on HTML and JavaScript rewriting, and at the 6th Workshop on Software Visualization, Evolution and Maintenance (VEM) [38] for his contribution to the automatic detection of bug fixing patterns, which is a joint work with Fernanda Madeiral and colleagues from the Federal University of Uberlândia in Brazil.

Browser fingerprinting [48] has emerged as a technique to track users without their consent. Studying the implication of this technique on user privacy, and proposing software systems that can self-protect against such techniques, have become an important topic in the research activities of Spirals on self-adaptation. In 2018, two papers authored by Spirals members in the context of the ongoing PhD thesis of Antoine Vastel have been published in A* conferences of the domain of security: [36] at the 39th IEEE Symposium on Security and Privacy, and [35] at 27th USENIX Security Symposium.

In 2018, we published at the 40th International Conference on Software Engineering, Track Software Engineering in Practice, a paper on Repairator [34], which this is the very first bot for automated software repair. This work has been conducted by Simon Urli and his coworkers in Spirals in the context of Inria ADT Librepair. An [article on Repairator](#) has also been published on the Inria web site.

Stéphanie Challita won the [Prix L'Oréal-UNESCO For Women in Science](#). She is among the 30 laureates rewarded out of 900 candidates. Stéphanie Challita has defended her PhD thesis in December 2018 on FLOUDS, a framework to achieve semantic interoperability in multi-cloud computing systems.

[Xscalibur](#) is a transfer project led by Christophe Gourdin and Philippe Merle that aims at creating a startup company with innovative solutions for the management of multi-cloud systems. The project has been selected by Serre Numérique Valenciennes. The research activities that led to this project have been, in part, conducted in the context of the joint lab between Spirals and the [Scalair](#) cloud hosting company. Several papers in relation with these research activities have also been published in 2018: [30], [25], [24], [13], [23].

BEST PAPERS AWARDS :

[26]

T. DURIEUX, Y. HAMADI, M. MONPERRUS. *Fully Automated HTML and Javascript Rewriting for Constructing a Self-healing Web Proxy*, in "Proceedings of the 29th IEEE International Symposium on Software Reliability Engineering (ISSRE 2018)", Memphis, United States, October 2018, <https://arxiv.org/abs/1803.08725> [DOI : 10.1109/ISSRE.2018.00012], <https://hal.inria.fr/hal-01746141>

[38]

F. MADEIRAL, T. DURIEUX, V. SOBREIRA, M. MAIA. *Towards an automated approach for bug fix pattern detection*, in "VEM '18 - Proceedings of the VI Workshop on Software Visualization, Evolution and Maintenance", São Carlos, Brazil, September 2018, <https://arxiv.org/abs/1807.11286> , <https://hal.archives-ouvertes.fr/hal-01851813>

WHISPER Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

The Whisper team published three papers at USENIX ATC, one of the major conferences of our domain:

- Coccinelle: 10 Years of Automated Evolution in the Linux Kernel. J. Lawall and G.Muller. [14]
- DSAC: Effective Static Analysis of Sleep-in-Atomic-Context Bugs in Kernel Modules. J.-J. Bai, Y.-P. Wang, J. Lawall, S.-M. Hu. [12]
- The Battle of the Schedulers: FreeBSD ULE vs. Linux CFS. J. Bouron, S. Chevalley, B. Lepers, W. Zwaenepoel, R. Gouicem, J. Lawall, G. Muller, J. Sopena. [13]

Gilles Muller was co-PC chair of DSN 2018, the premier venue for dependable systems.

Julia Lawall was co-PC chair of the ASE 2018 Tool Demo track, in preparation for being the co-PC chair of the main ASE research paper track in 2019.

5.1.1. Awards

The original work on Coccinelle “Documenting and automating collateral evolutions in Linux device drivers” [8] received an ACM EuroSys Test-of-Time award, recognizing it as the paper from EuroSys 2008 that is having the most lasting and current impact (<http://eurosys2018.org/awards/>).

WIDE Project-Team

4. Highlights of the Year

4.1. Highlights of the Year

Awards

Michel Raynal is the recipient of the 2018 IEEE award for Outstanding Technical Achievement in Distributed Computing.

ALPINES Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

Laura Grigori was awarded with E. Cancès, Y. Maday, and J.-P. Piquemal an ERC Synergy Grant for the Extreme-scale Mathematically-based Computational Chemistry project (EMC2), 2018. A description of the project can be found [here](#).

AVALON Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

- Henri Casanova, Arnaud Legrand, Martin Quinson and Frédéric Suter. "SMPI Courseware: Teaching Distributed-Memory Computing with MPI in Simulation" received the "Best Paper Award" of the Workshop on Education for High-Performance Computing (EduHPC-18).
- Anchen Chai, Sorina Camarasu-Pop, Tristan Glatard, Hugues Benoit-Cattin and Frédéric Suter. "Evaluation through Realistic Simulations of File Replication Strategies for Large Heterogeneous Distributed Systems" received the "Best Workshop Paper on Heterogenous Systems" of the 24th International European Conference on Parallel and Distributed Computing (EuroPar'2018).

BEST PAPERS AWARDS :

[15]

H. CASANOVA, A. LEGRAND, M. QUINSON, F. SUTER. *SMPI Courseware: Teaching Distributed-Memory Computing with MPI in Simulation*, in "EduHPC-18 - Workshop on Education for High-Performance Computing", Dallas, United States, November 2018, p. 1-10, <https://hal.inria.fr/hal-01891513>

[17]

A. CHAI, S. CAMARASU-POP, T. GLATARD, H. BENOIT-CATTIN, F. SUTER. *Evaluation through Realistic Simulations of File Replication Strategies for Large Heterogeneous Distributed Systems*, in "EuroPar 2018 - 24th International European Conference on Parallel and Distributed Computing ; Workshop HeteroPar 2018", Turin, Italy, Lecture Notes in Computer Science (LNCS), August 2018, forthcoming, <https://hal.archives-ouvertes.fr/hal-01887369>

DATAMOVE Project-Team (section vide)

HIEPACS Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

The year 2018 was rich in regional, national and European calls for projects. This year, our success rate was quite high for the proposals we submitted; four of them went through: one ANR, namely **SASHIMI**, a major regional project, namely hpc-ecosystem benefiting many EPIs in Inria Bordeaux Sud-Ouest, and two H2020 projects, namely **EoCOE** and **PRACE-6IP**. These projects will provide new applications and collaborative frameworks to support our ongoing and future research and transfert activities.

KERDATA Project-Team (section vide)

POLARIS Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

- Bruno Gaujal joined the scientific committee of the GDR IM (Informatique Mathématique).
- Arnaud Legrand co-created a MOOC on “Recherche reproductible : principes méthodologiques pour une science transparente” hosted on the FUN platform <https://www.fun-mooc.fr/courses/course-v1:inria+41016+session01bis/about>.

5.1.1. Awards

- The paper by Nicolas Gast and co-authors received the Best Paper Award at ACM SIGMETRICS 2018.
- The paper by Patrick Loiseau and co-authors was nominated for the Best Paper Award at ACM FAT* 2018.
- The work on “Multi-Agent Online Learning with Imperfect Information” by Panayotis Mertikopoulos and co-authors was shortlisted for the INFORMS George Nicholson Best Student Paper Award.
- Panayotis Mertikopoulos received an Outstanding Reviewer Award at NIPS 2018.
- Benjamin Roussillon was co-laureate of the “Prix de mémoire de master 2018 en RO/AD” (best MSc thesis in operations research) from ROADEF for his Master thesis on “Development of adversarial classifiers using Bayesian games” under the supervision of Patrick Loiseau.

BEST PAPERS AWARDS :

[24]

N. GAST, B. V. HOUDT. *A Refined Mean Field Approximation*, in "ACM SIGMETRICS 2018", Irvine, France, June 2018, 1, <https://hal.inria.fr/hal-01891642>

[30]

T. SPEICHER, M. ALI, G. VENKATADRI, F. RIBEIRO, G. ARVANITAKIS, F. BENEVENUTO, K. P. GUMMADI, P. LOISEAU, A. MISLOVE. *Potential for Discrimination in Online Targeted Advertising*, in "FAT 2018 - Conference on Fairness, Accountability, and Transparency", New-York, United States, February 2018, vol. 81, p. 1-15, <https://hal.archives-ouvertes.fr/hal-01955343>

ROMA Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

- Anne Benoit was the program chair of 32nd IEEE IPDPS conference (IEEE International Parallel & Distributed Processing Symposium), held in Vancouver, Canada, May 21–25, 2018.
- Bora Uçar was the general chair of 32nd IEEE IPDPS conference (IEEE International Parallel & Distributed Processing Symposium), held in Vancouver, Canada, May 21–25, 2018.

5.1.1. Awards

BEST PAPERS AWARDS :

[29]

T. HÉRAULT, Y. ROBERT, A. BOUTELLER, D. ARNOLD, K. B. FERREIRA, G. BOSILCA, J. DON-GARRA. *Optimal Cooperative Checkpointing for Shared High-Performance Computing Platforms*, in "APDCM", Vancouver, Canada, 2018, <https://hal.inria.fr/hal-01968441>

STORM Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

- “Habilitation à diriger les recherches” (HDR) of Samuel Thibault, Dec.2018.

TADAAM Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

Guillaume MERCIER is the chairman of the Hardware Topologies Management Working Group of the MPI Forum. This working group was created officially in December by Inria's impulse and has been rallied since by many institutions taking part in the MPI Forum. The goal of this working group is to standardize hardware topologies management mechanisms and abstractions in the MPI standard.

DIVERSE Project-Team

4. Highlights of the Year

4.1. Highlights of the Year

This year, we would like to highlight the following results:

- In terms of publications:
 - Among the many articles published this year, articles [25] and b [28] have been published at the highest level but above all they represent perfectly the type of research conducted within the team: open research based on studies of major open-source software and in connection with the developer communities.
 - The results of this year's SLE conference also make us very proud. 4 accepted papers including 1 best vision paper [33], 1 best artifact (hal-01890446) and the award for the best reviewer for a former doctoral student of the team recently appointed associate professor at the University of Nantes.
- A former PhD student of the team, Pierre Laperdrix was awarded the "*Le prix de thèse Gilles Kahn 2018 (premier accessit), décerné par la SiF et patronné par l'Académie des Sciences*" for his PhD entitled *Browser Fingerprinting: Exploring Device Diversity to Augment Authentication and Build Client-Side Countermeasures*.
- Three new PhDs and one new HDR have been successfully defended this year.
- A new CNRS junior researcher, Djamel Eddine Khelladi, will join the team in 2019.
- Mathieu Acher successfully submitted its ERC starting grant program: Killing and Resurrecting Software Variability (REVAR). This research program fully structures the Variability axis of the team for the next years.
- Didier Vojtisek, research engineer hosted since many years within the team was awarded the Inria award (*appui à la recherche*) with Guillaume Cassonnet, Christophe Demarey, Herve Mathieu, Florent Pruvost for the Sonarqube project. As a research team in the field of software engineering, we study and produce many open source software artefacts. In this context, we regularly test and deploy internally support services to produce high-quality software. Sonar (SonarQube ancestor) had been deployed internally since 2008. Embedding research engineers into software engineering research teams as often as possible is undoubtedly a win-win operation for both parties (the research team but also the SED and therefore Inria as a whole)

4.1.1. Awards

Paper was awarded the best vision paper at SLE'18.

Paper was awarded the best artefact associated to a scientific paper at SLE'18.

Paper was awarded the best paper at ICMT'18.

BEST PAPERS AWARDS :

[33]

F. COULON, T. DEGUEULE, T. VAN DER STORM, B. COMBEMALE. *Shape-Diverse DSLs: Languages without Borders (Vision Paper)*, in "SLE 2018 - 11th ACM SIGPLAN International Conference on Software Language Engineering", Boston, United States, ACM, November 2018, p. 215-219 [DOI : 10.1145/3276604.3276623], <https://hal.archives-ouvertes.fr/hal-01889155>

[36]

M. LEDUC, T. DEGUEULE, B. COMBEMALE. *Modular Language Composition for the Masses*, in "SLE 2018 - 11th ACM SIGPLAN International Conference on Software Language Engineering", Boston, United States, November 2018, p. 1-12 [DOI : 10.1145/3276604.3276622], <https://hal.inria.fr/hal-01890446>

[32]

J.-M. BRUEL, B. COMBEMALE, E. GUERRA, J.-M. JÉZÉQUEL, J. KIENZLE, J. DE LARA, G. MUSS-BACHER, E. SYRIANI, H. VANGHELUWE. *Model Transformation Reuse across Metamodels - A classification and comparison of approaches*, in "ICMT 2018 - International Conference on Theory and Practice of Model Transformations", Toulouse, France, LNCS, Springer, June 2018, vol. 10888, p. 92-109 [DOI : 10.1007/978-3-319-93317-7_4], <https://hal.inria.fr/hal-01910113>

EASE Team (section vide)

FOCUS Project-Team (section vide)

INDES Project-Team (section vide)

PHOENIX-POST Team (section vide)

RMOD Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Release of Pharo 7

We released a release candidate for Pharo 7, with a release to be expected early 2019. More information at <http://pharo.org>.

5.1.2. Awards

- Guillermo Polito, Pablo Tesone, Esteban Lorenzano and Nicolás Passerini won the 1st place in the Innovation Technologies Award at ESUG 2018.
- Christian Marlon Souza Couto, Henrique Rocha, and Ricardo Terra. A Quality-oriented Approach to Recommend Move Method Refactorings. 1st place in 17th Brazilian Symposium on Software Quality, SBQS p. 11—20, ACM, New York, NY, USA, 2018.

STACK Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Remarkable results: research and third-party funding

Regarding scientific results, the team has produced a number of outstanding results on resource and data managements in large-scale infrastructures, notably on how to place VMs in Clouds [5], and on how to manage VM images in geo-distributed clouds [18]. On the software side, the team has proposed a new model-based Architecture to design and implement autonomic and heterogeneous Cloud Systems [12]. Finally on the energy side, the team has deployed the SeDuce platform that allows researchers to investigate energy concerns in data-centers thanks to a numerous of energy sensors deployed across the dedicated facility [19], [20], [34].

Concerning third-party funding, 2018 has seen the acceptance of the VERDI “Etoiles Montantes” project. “Etoiles Montantes” is a highly-competitive call with the goal of bootstrapping ERC submissions.

5.1.2. Awards

In 2018, the team has received two best paper awards and one individual award:

- **Programme Jeunes Talents France Chine 2018** Shadi Ibrahim was selected for the “Programme Jeunes Talents France Chine” award.

BEST PAPERS AWARDS :

[12]

H. BRUNELIERE, Z. AL-SHARA, F. ALVARES, J. LEJEUNE, T. LEDOUX. *A Model-based Architecture for Autonomic and Heterogeneous Cloud Systems*, in "CLOSER 2018 - 8th International Conference on Cloud Computing and Services Science", Funchal, Portugal, March 2018, vol. 1, p. 201-212, Best Paper Award [DOI : 10.5220/0006773002010212], <https://hal.archives-ouvertes.fr/hal-01705248>

[19]

J. PASTOR, J.-M. MENAUD. *SeDuCe: a Testbed for Research on Thermal and Power Management in Datacenters*, in "GREEN 2018 - Third International Conference on Green Communications, Computing and Technologies", Venice, Italy, September 2018, p. 1-6, <https://hal.inria.fr/hal-01855452>

AGORA Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

- Walid Bechkit holds the PEDR (2017-2021).
- Khaled Boussetta obtained his HDR from the University Paris 13, in December 2018.
- Khaled Boussetta holds the PEDR (2018-2022).
- Khaled Boussetta was promoted MCF *Hors Classe* in September 2018.
- Hervé Rivano holds the PEDR (2017-2021).
- Razvan Stanica holds the PEDR (2016-2020).
- Pascale Vicat Blanc joined Agora as Inria Senior Researcher, in September 2018.

COATI Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

Guillaume Ducoffe, former PhD student of COATI, is the recipient of the second PhD prize delivered jointly by GDR RSD and Association ACM SIGOPS France (ASF), edition 2018, for his PhD thesis entitled "Metric properties of large graphs".

5.1.2. *Habilitation à Diriger des Recherches*

Frédéric Giroire has defended his Habilitation à Diriger des Recherches, entitled "*Optimisation des infrastructures réseaux. Un peu de vert dans les réseaux et autres problèmes de placement et de gestion de ressources*" [1], at Univ. Côte d'Azur on October 23, 2018.

Abstract: Pushed by the new sensitivity of the society, politics, and companies to energy costs and global warming, he investigated the question of how to build green networks. He first studied some practical scenarios to answer the question: how much energy could be saved for Internet Service Providers by putting into practice energy efficient protocols? It led him to study fundamental problems of graph theory.

At the core of these energy efficient methods, there is a dynamic adaptation to the changes of demands, which is impossible to do in legacy networks which are mostly manually operated. The emergence of two new paradigms, software defined networking (SDN) and network function virtualization (NFV), leads to a finer control of networks and thus bears the promise to put energy efficient solutions into practice. He thus studied how to use SDN to implement dynamic routing.

His approach has been to use theoretical tools to solve problems raised by the introduction of new technologies or new applications. His tools come mainly from combinatorics and in particular from graph theory, algorithms, optimization and probabilities. When he was able to propose new methods of resolution, he then tried to evaluate their practical impact by numerical evaluation, simulation or experimentation with realistic scenarios.

5.1.3. *New team members*

- Alexandre Caminada has been recruited as a University Professor of Univ. Nice Sophia Antipolis since September 2018 and he is now a member of COATI. Since September 2017, he is the director of the Polytech'Nice engineering school of Univ. Nice Sophia Antipolis.
- Emanuele Natale has been recruited as a Junior researcher at CNRS in 2018. He will join COATI in January 2019.

DANTE Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Machine Learning & Data Science for Complex and Dynamical Models

The Dante team is part of a consortium (including the LIP, the Physics Lab from ENS de Lyon, the LabHC from U. Jean Monnet and LIRIS from U. Lyon 1) that got funded a 4 years project within the call “Scientific Breakthrough” of **IDEX de Lyon**.

With a total envelope of 1.2M euros, the project "mACHine LeArning & Data sciEnce for coMplex and dynamIcal modelS" (ACADEMICS) combines **Machine Learning (ML) and Data Science (DS)** for the purpose of scientific research into two challenging directions:

1. **Computing and information processing** – develop new theoretical frameworks and learning algorithms adapted to difficult scientific contexts involving heterogeneous, irregular, error-prone, dynamic and complex data, while taking into account prior knowledge whenever it is relevant.
2. **Complex and dynamic models learning** – leverage the synergy between ML and DS to devise data-driven models in two scientific domains: **climate modeling**, and **quantitative understanding of social systems**. Focusing on these two case studies, the project will tackle the key issue of how to learn intricate models from numerous, heterogeneous and dynamic data.

The **research program** is elaborated along specific scientific issues that can reasonably lead to significant results within the 3-year lifetime of the project. The two case studies are instrumental to frame the way ML and DS can combine to yield relevant models. The methodological axes are:

- **Representation and model learning for complex data:** How to find sparse latent spaces for complex data or graphs, and how to learn compressed models? How to identify exceptional phenomena?
- **Estimation and learning from multi-source and/or dynamic data:** How to transfer a model learned from *source* data to related but different *target* data? How to learn from multi-source complex data?
- **Distributed and adaptive machine learning for graphs and complex models:** How to design distributed optimization-based learning? How to develop adaptive and distributed model inference in high dimension?

In close connexion with these methodological questions, the climate modeling use-case raises the central interrogation of **how to learn effective dynamic models**, firstly in a nonparametric way by means of ML tools and secondly, by mixing several data sources (from observations and simulations). As for computational social science, the challenge is **to embed together in ML approaches, individual features, global structures and dynamics of social networks**. The goal here, is to benefit from their complementarity to infer latent correlations, to identify behavioral mechanisms and to better model emergent social phenomena.

5.1.2. Books on Dynamic Networks by Márton Karsai

After a book chapter on *Control Strategies of Contagion Processes in Time-varying Networks* in Temporal Network Epidemiology in collaboration with Nicola Perra [65], a full book on *Bursty Human Dynamics* was just released at the end of the year in collaboration with Hang-Hyun Jo and Kimmo Kaski [40].

5.1.3. Awards

- Márton Karsai received the Junior Scientific Award of the Complex System Society, Sept. 2018.
- Márton Karsai, awarded Fellow of the ISI Foundation (Torino, Italy), 2018.
- Samuel Unicomb (PhD of Márton Karsai) obtained the best poster award at the NetSci’18 conference in Paris in June 2018.

DIANA Project-Team

4. Highlights of the Year

4.1. Highlights of the Year

4.1.1. Awards

Karyna Gogunska's paper on "On the Cost of Measuring Traffic in a Virtualized Environment" [20] got the Best Student Paper Award at the IEEE Cloudnet 2018 in Japan.

4.1.2. ANR JCJC DET4ALL

Damien Saucez's project titled DET4ALL was accepted in the JCJC programme (2019-2021). The goal of this project is to apply the concept of network programmability to the world of industrial communicating systems.

4.1.3. ACM SIGCOMM Artefact Evaluation Committee

Our team organized the Reproducibility'17@SIGCOMM workshop (proposed and co-chaired by Damien Saucez). Based on the results of the workshop, we put in place the ACM SIGCOMM *Artefact Evaluation Committee* (AEC). The role of the AEC is to assess the reproducibility level of papers accepted to any ACM SIGCOMM sponsored conferences and journals during the year 2018. The reproducibility quality is awarded by ACM reproducibility badges⁰. Authors volunteered to be evaluated and we received 33 demands. In parallel to this effort, the organisers of the ACM CoNEXT'18 conference asked us to assess the reproducibility level of CoNEXT papers in 2018 as part of the publication process. We accepted and out of the 32 CoNEXT papers, 14 volunteered to be evaluated and 12 received an award. The result is that ACM CoNEXT'18 is the first ever ACM SIGCOMM sponsored conference to award reproducibility. Based on that the main ACM SIGCOMM conference has decided to make a trial in 2019 and integrate reproducibility evaluation as part of the publication process for 2019.

⁰<http://www.acm.org/publications/policies/artifact-review-badging>

DIONYSOS Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

We organized the *13th International Conference in Monte Carlo & Quasi-Monte Carlo Methods in Scientific Computing*, in Rennes, July 1-6, 2018. The MCQMC Conference is a biennial meeting on Monte Carlo and quasi-Monte Carlo methods and the premier event on the topic; it has attracted 300 people from all over the world.

5.1.1. Awards

Pierre L'Ecuyer received the 2018 Outstanding Simulation Publication Award by Informs (recognizing outstanding contributions to the simulation literature) for his article published in 2016 in *Operations Research* [84] on arrival rates modeling with application to call centers.

BEST PAPERS AWARDS :

[59]

Q. T. A. PHAM, Y. HADJADJ-AOUL, A. OUTTAGARTS. *Deep Reinforcement Learning based QoS-aware Routing in Knowledge-defined networking*, in "Qshine 2018 - 14th EAI International Conference on Heterogeneous Networking for Quality, Reliability, Security and Robustness", Ho Chi Minh City, Vietnam, December 2018, p. 1-13, <https://hal.inria.fr/hal-01933970>

DYOGENE Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

Publication of a monograph *Stochastic Geometry Analysis of Cellular Networks* by Cambridge University Press [30] that presents latest analytic techniques and results from stochastic geometry for modelling of heterogeneous cellular networks.

5.1.1. Awards

Our paper “Optimal Algorithms for Non-Smooth Distributed Optimization in Networks” by K. Scaman, F. Bach, S. Bubeck, Y.T. Lee and L. Massoulié won a best paper award at the NeurIPS 2018 conference.

EVA Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

5.1.1. Awards

- Finalist, best paper award at the Global IoT Summit 2018, for paper “Why Channel Hopping Makes Sense, even with IEEE 802.15.4 OFDM at 2.4 GHz”.
- **Thomas Watteyne** identified as “Key Innovator” by the European Commission’s Innovation Radar, category “commitment” for the innovation “Online platform of testing tools for the Internet of Things”.

5.1.2. Transfer

- Creation of the Wattson Element startup, which commercializes the Falco solution (<https://wefalco.fr/>).
- Publication of RFC8480

FUN Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

- Valeria Loscrí has been elevated to the IEEE Senior Membership degree.
- Valeria Loscrí and Nathalie Mitton highlighted as Women in Computer Science 2018 by Elsevier <https://www.elsevier.com/physical-sciences-and-engineering/computer-science/journals/women-in-computer-science>.

5.1.1. Awards

Paper [65] has been awarded Top Paper from 2017 in Transactions on Emerging Telecommunications Technologies, as selected by the Editorial Board. See https://onlinelibrary.wiley.com/page/journal/21613915/homepage/ett_best_paper_awards.htm.

VITALOS, issued from the FP7 VITAL project from which the FUN team is one of the main contributors, has been awarded as one of the 50 most transformative smart projects: <https://spring.smartcitiesconnect.org/Smart50Awards/>.

GANG Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

WENDY: Workshop on Emergent Algorithms and Network Dynamics

GANG/Inria Paris was the institutional organizer of WENDY workshop at Institut Henri-Poincaré, Paris, October 10-11, 2018, <https://wendy.paris> (chair: Adrian Kosowski).

The goal of the project was to facilitate the exchange of ideas between researchers working on distributed computing theory, modeling random structures, and discrete dynamical systems.

The main theme of the workshop was programming local interaction dynamics on networks, so as to obtain the desired emergent effects on the system as a whole. Central topics included:

- Evolving graph models and dynamics on random graphs
- Bio-inspired computing and computing with biological agents
- Chemical reaction networks
- Markovian and non-Markovian processes on networks.

BDA: Workshop on Biological Distributed Algorithms

Amos Korman chaired the organizing committee and co-chaired the program committee of the 6th workshop on Biological Distributed Algorithms (BDA, <http://www.sn1.salk.edu/~navlakh/BDA2018/>), co-located with ACM PODC in London on July 23rd, 2018.

BDA was focused on the relationships between distributed computing and distributed biological systems and in particular, on analysis and case studies that combine the two. Such research can lead to better understanding of the behavior of the biological systems while at the same time developing novel algorithms that can be used to solve basic distributed computing problems.

The workshop featured 6 invited talks and over a dozen accepted contributed submissions, with generous financial support offered to participants by Amos Korman's ERC grant.

INFINE-POST Team

4. Highlights of the Year

4.1. Highlights of the Year

4.1.1. Awards

Together with his co-authors, Emmanuel Baccelli was awarded the **best demo award** at the 3rd Cloudification of the Internet of Things Conference, in Paris, July 2018, for the demo on **Orchestration of IoT Device and Business Workflow Engine on Cloud** (collaboration with S. Kikuchi, I. Thomas, O. Jallouli, J. Dörr, A. Morgenstern, and K. Schleiser).

RIOT Summit 2018

We successfully organized in September 2018 the thrid RIOT Summit, in Amsterdam. The RIOT Summit 2018 gathered 100+ enthusiastic industrial participants, makers and academics involved in RIOT. Relevant partners such as Ericsson, HERE Technologies, CodeCoup, Wolf SSL, as well as 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>.

Associated team - EMBRACE

2018 was the second year of the EMBRACE Associated team. The EMBRACE (IEveraging huMan Behavior for Resource AlloCation and services orchestration modElS) team is composed by members of the INFINE and by three Brazilian teams from three different Brazilian Universities. The EMBRACE project addresses the topic of designing efficient solutions for 5G networks taking into account human behavior, uncertainty, and heterogeneity of networking resources.

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

Neo Project-Team

5. Highlights of the Year

5.1. Highlights of the Year

NEO started a collaboration with QWANT within the joint QWANT-Inria laboratory, with two research projects. One is a direct collaboration, the other one is within the PIA ANSWER project. See Sections 8.1.2 and 9.2.1 .

The book “Constrained Markov Decision Processes” by Eitan Altman is cited over 1000 times in Google Scholar.

Giovanni Neglia has been nominated IEEE Infocom 2018 Distinguished TPC member (Jan. 2018).

5.1.1. Awards

BEST PAPERS AWARDS :

[36]

E. HARGREAVES, D. S. MENASCHÉ, G. NEGLIA, C. AGOSTI. *Visibilidade no Facebook: Modelos, Medições e Implicações*, in "Brazilian Workshop on Social Network Analysis and Mining (BraSNAM)", Natal, Brazil, July 2018, <https://hal.inria.fr/hal-01956316>

[33]

K. VEERARUNA, S. MEMON, M. K. HANAWAL, E. ALTMAN, R. DEVANAND. *User Response Based Recommendations: A Local Angle Approach*, in "COMSNETS 2018 - 10th International Conference on COMMunication Systems & NETworkS", Bangalore, India, January 2018, p. 1-8, <https://hal.inria.fr/hal-01702355>

POEMS-POST Team

5. Highlights of the Year

5.1. Highlights of the Year

- POEMS project-team reached the deadline of 12 years at the end of 2017. We have devoted a large part of our time during the first half-year to conceive and write a text of 20 pages which describes the new project that we submit to the management of Inria, in order to pursue our research on the modeling and simulation of wave phenomena. This project is currently discussed by several experts, in interaction with ourselves, before the final decision of creation of the new project-team.
- S. Chaillat co-organized with X. Claeys (Sorbonnes & EPI ALPINES) the symposium of the *International Association for Boundary Element Methods (IABEM)*, which took place in Paris in June 2018. There were about 140 attendees.
- A.-S. Bonnet-Ben Dhia co-organized a workshop entitled “*Advanced Theoretical and Numerical Methods for waves in structured Media*” in Paris in March 2018, in the framework of the GDR Ondes. There were about 90 attendees.
- P. Ciarlet is co-author of a book entitled “*Mathematical Foundations of Computational Electromagnetism*”, published in the serie *Applied Mathematical Sciences* by Springer.

RESIST Team

5. Highlights of the Year

5.1. Highlights of the Year

- Raouf Boutaba gave his inaugural conference as Inria Internationale Chair and Professor@Lorraine about *Convergence of telecommunications and information technologies: towards programmable, intelligent and resilient networks*.
- The team (Jérôme François and Isabelle Chrisment) organized the RESSI'18 (Rendez-vous de la Recherche et de l'Enseignement de la Sécurité des Systèmes d'Information).

SOCRATE Project-Team

4. Highlights of the Year

4.1. Highlights of the Year

4.1.1. Various

Two new workshop organized by the team in relation with CorteXlab:

- First French GNU Radio days: <https://gnuradio-fr-18.sciencesconf.org/>
- ISP-IoT : First Winter School on Information Theory and Signal Processing for Internet of Things : <https://isp-iot.sciencesconf.org>

4.1.2. Awards

The PhD of Victor Quintero (former PhD in Socrate) received the best PhD award in the area of digital society in Nov 2018.

Samir M. Perlaza is Visiting Research Collaborator (Honorific Position) Oct. 2018; Term 2018 - 2019. Department of Electrical Engineering, Princeton University

Samir M. Perlaza has been awarded a “Make our Planet Great Again” Fellowship, Sep. 2018 by Embassy of France in the United States of America and Thomas Jefferson Foundation in New York, NY.

The article *Karatsuba with Rectangular Multipliers for FPGAs* , presented by Florent de Dinechin, obtained the Best Paper Award of the Arith 2018 conference in Amherst, MA.

BEST PAPERS AWARDS :

[17]

M. KUMM, O. GUSTAFSSON, F. DE DINECHIN, J. KAPPAUF, P. ZIPF. *Karatsuba with Rectangular Multipliers for FPGAs*, in "ARITH 2018 - 25th IEEE International Symposium on Computer Arithmetic", Amherst, United States, IEEE, June 2018, p. 13-20, Best paper award [DOI : 10.1109/ARITH.2018.8464809], <https://hal.inria.fr/hal-01773447>