

# Curriculum Vitæ

## Arnaud Legrand

Laboratoire d'Informatique de Grenoble \ UMR 5217 (CNRS, INRIA, INPG, UJF,  
UPMF) \

.4em]September, 2017

## Personal Information

**Last, First, and Middle Names:** Legrand, Arnaud, Régis

**Date of Birth:** 02-20-1977

**Place of Birth:** Créteil (Val de Marne 94), France

**Nationality:** French

**Marital Status:** Married, five children

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## Education and Professional Experience

**Nov 2015 :** Habilitation à diriger des recherches, /Scheduling for Large Scale Distributed Computing Systems: Approaches and Performance Evaluation Issues./ Université Grenoble Alpes,

**Oct. 2004-... :** Tenured Researcher for the CNRS (*Chargé de Recherche*) at Laboratoire d'Informatique de Grenoble (formerly known as "Informatique et Distribution" laboratory).

**2003-2004:** Post-Doctoral Research Associate, École Normale Supérieure de Lyon (France).

**2000-Dec. 2003:** Ph.D. Computer Science, École Normale Supérieure de Lyon. Laboratoire de l'Informatique du Parallélisme. \ Thesis: *Heterogeneous parallel algorithms and scheduling : static and dynamic approaches* \ Advisors: Prof. Olivier BEAUMONT and Prof. Yves ROBERT.

**1999-2000;** Diplôme d'études approfondies (DEA/M.Sc.) in Fundamental Computer Science (*Operating Systems, Networks and Parallel Algorithms* section), École Normale Supérieure de Lyon, France.

Thesis: *Parallel linear algebra kernels: heterogeneous and non-dedicated environments*.

Advisors: Prof. Olivier BEAUMONT and Prof. Yves ROBERT.

**June-July 1999:** Two month internship at University of California, San Diego (USA).

Thesis: *Scheduling Heuristics for Parameter-Sweep Applications on a Grid computing Platform*.

Advisors: Prof. Fran BERMAN and Prof. Henri CASANOVA.

**1997-2000** Magistère d'Informatique et de Modélisation (B.Sc. in Computer Science and Modeling); École Normale Supérieure de Lyon, France.

## Research Interest

My research targets the management (mostly from an algorithmic point of view, i.e., scheduling, load balancing, fairness, game theory...) and performance evaluation (in particular through simulation, visualization, statistical analysis, ...) of large scale distributed computing infrastructures such as clusters, grids, desktop grids, volunteer computing platforms, clouds, ... when used for scientific computing.

Although my motivations are quite practical, my work is mostly theoretical but done in connection with practitioners whenever possible in order to keep my modeling assumptions as reasonable as possible.

### Scheduling for Distributed Platforms

I study **scheduling** problems arising on distributed platforms (like computing grids) with a particular emphasis on **heterogeneity** and **multi-user** issues, hence some background in **game theory**.

During my PhD thesis, I initially worked on scheduling and parallel algorithms for dense linear algebra kernels on heterogeneous platforms [21, 19] but my main results have been obtained in the context of **steady-state scheduling**, i.e., throughput optimization instead of more classical makespan minimization [18, 15, 13, 10] and **divisible load scheduling** [17, 11]. These two models are relaxed versions of more classical scheduling frameworks and allow to easily account for key platform characteristics such as heterogeneity or complex topology while providing efficient practical solutions.

Since then, I have been particularly interested in trying to incorporate a notion of user in such scheduling problems, in particular using classical game theory notions:

- Non-Cooperative Throughput Optimization [38, 37],
- Max-min Fair Throughput Optimization [39, 8],
- Proportionally Fair Distributed Throughput Optimization [34, 4],
- Centralized Response Time Optimization [40, 42, 9],
- Non-Cooperative Throughput and Response Time Optimization [28].

Some of this work has been part of the [ANR ALPAGE](#) and the [ANR DOCCA](#). It is also the result of my participation to the [CloudShare](#) and [CloudComputing@home](#) associated teams with Berkeley.

## Simulation and Performance Evaluation of Distributed Platforms

Since 2000, I am one of the main developers of the [SimGrid](#) project. SimGrid is a **simulation** toolkit for building simulators of distributed applications (originally designed for scheduling algorithm evaluation purposes). This software is developed in collaboration with [Henri Casanova](#), [Martin Quinson](#) and [Frédéric Suter](#) and has been used publishing at least 140 papers in the last 10 years. Beside our long term investment and support, we try to provide high-quality software and to study the **validity** of such simulations.

My most notable scientific contributions in this software are the following:

- Deep assessment of the validity of fluid network models [5, 33],
- Fast and scalable implementation of fluid network models [31, 27],
- Reliable performance prediction capabilities in the context of complex HPC applications [24, 23].

A general overview of these contributions is given in [3].

All this work has been supported by the [INRIA](#) through ADTs and ODL and by the [ANR USS-SimGrid project](#) and is now supported by the by [ANR SONGS project](#).

## Responsibilities in Scientific Evaluation

I participated several times to the evaluation of projects for the ANR or for the CAPES/COFECUB. I regularly do numerous reviews (around 25 to 35 reviews a year) for various journals (JPDC, ParCo, TPDS, JoGC, TKDE) and conferences (IPDPS, CCGrid, Grid, EuroPar, BDA, ISPA, ICCS, HiPC, ...).

I served in the program committee of the following conferences:

- 2017: CCgrid, Cluster, PPAM
- 2016: HIPC, EuroPar, ICPP, COMPAS
- 2015: HIPC, COMPAS
- 2014: ICPP, HIPC, COMPAS
- 2013: ICPP, IPDPS, PPAM, COMPAS
- 2012: IPDPS, Renpar
- 2011: CCgrid

- 2010: PCGrid
- 2009: HPDC, Renpar, PCGrid (Workshop on Desktop Grids and Volunteer Computing Systems)
- 2008: Grid, IPDPS, Renpar, PCGrid
- 2004: Grid

I also organized the following workshops:

- 2014-2017: International Workshop on Reproducibility in Parallel Computing (RepPar) in conjunction with Euro-Par
- 2007: Workshop on Programming Models for Grid Computing, held in conjunction with CCGrid'07 (7th IEEE International Symposium on Cluster Computing and the Grid)

## Thesis Committees

I have been member of the jury for the following PhD thesis.

- Harald Servat, Doctorat informatique de l'Universitat Politècnica de Catalunya, Apr. 2015. Towards instantaneous performance analysis using coarse-grain sampled and instrumented data.
- Sorina Camarasu Pop, Doctorat informatique de l'INSA Lyon, novembre 2013. *Exploitation d'infrastructures hétérogènes de calcul distribué pour la simulation Monte-Carlo dans le domaine médical.*
- Javier Celaya, Doctorat informatique de l'Université de Zaragoza, Dec. 2013. *STaRS: A Scalable Task Routing Approach to Distributed Scheduling.*
- Matthieu Pérotin, Doctorat informatique de l'Université François Rabelais, Tours, Dec. 2008. *Calcul haute performance sur matériel générique.*
- Maxime Martinasso, Doctorat informatique système et communication, Laboratoire d'Informatique de Grenoble (LIG), 2007. *Analyse et modélisation des communications concurrentes dans les réseaux haute-performance.*
- Feryal Moulai, Doctorat informatique système et communication, Laboratoire d'Informatique de Grenoble (LIG), 2007. *Nouvelles approches pour l'ordonnancement d'applications parallèles sous contraintes de déploiement d'environnements sur grappes.*

## Supervision

### PhD. Students

- Bruno Luis de Moura Donassolo (CIFRE Orange 2017-...): Decentralized management of applications in Fog computing environments.
- Vinicius Garcia Pinto (co-tutelle with UFRGS 2013-...): Performance analysis and visualization of dynamic task-based applications.
- Rafael Tesser (co-tutelle with UFRGS 2013-...): Simulation and performance evaluation of dynamical load balancing of an over-decomposed Geophysics application.

- Christian Heinrich (2015-...): Modeling of performance and energy consumption of HPC systems.
- Luka Stanisic (2012-2015): Performance evaluation, modeling and simulation of HPC systems; Experimental methodology and reproducible research (co-advised with Jean-François Méhaut, funded by the French Ministry for Research)
- Rémi Bertin (2007-2009): Collaboration Mechanisms in Peer-to-Peer and Collaborative Computing Systems (co-advised with Corinne Touati, funded by ANR DOCCA).
- Pedro Velho (2006-2011): Modeling and Simulation of Large Scale Distributed Platforms (co-advised with Jean-François Méhaut, funded by a Brazilian grant).

### **PostDoc, Engineers**

- Lucas Schnorr (Invited Professor 2016-2017): Tracing, observation and visualization of large scale distributed systems.
- Augustin Degomme (Eng. 2012-2015): Simulation/performance prediction of MPI applications
- Sascha Hunold (Post-doc 2011-2012): Design of Experiments, Reproducible Research, Fair Scheduling of Bag-of-Tasks Applications Using Distributed Lagrangian Optimization
- Lucas Schnorr (Post-doc 2009-2012): Tracing, observation and visualization of large scale distributed systems.
- Pierre Navarro (Eng. 2010-2012): Improvement of the SimGrid Framework (scalability, robustness, new features, ...)
- Lionel Eyraud (Post-doc 2007): Automatically Building Sound Network Representations

### **Engineer/Master Students**

- Tom Cornebize (MSc 2017): Capacity Planning of Supercomputers, Simulating MPI Applications at Scale
- Steven Quinito Masnada (MSc 2016): Semi-Automatic Performance Optimization of HPC Kernels
- Wagner Kolberg (MSc 2012): Faithful Modeling of MapReduce Applications
- Luka Stanisic (MSc 2012): Performance evaluation of cache performances on modern CPUs
- Émile Morel (stage de fin d'étude IUT, 4 months, 2008-2009): Design and implementation of a collaborative bibliography entry management server
- Bruno Luis de Moura Donassolo (Engineer, Msc, 2007-2009): Design and Implementation of a Scalable Scheduler for the SimGrid Project; Study of Non-Cooperative Optimization in Volunteer Computing Systems
- Darina Dimitrova (Master Research, 4 months, 2006): Application-level Network Topology Discovery in Grid Computing Platforms
- Rémi Vannier (Master Research, 4 months, 2006): Proportionally Fair and Distributed Scheduling of Multiple Bag-Of-Task Applications

# Software Development

## SimGrid

SimGrid: a toolkit that provides core functionalities for the simulation of distributed applications in heterogeneous distributed environments. SimGrid is a 15 years-old free software project whose specific goal is to facilitate research in the area of distributed and parallel application scheduling on distributed computing platforms ranging from simple network of workstations to Computational Grids. I am one of the main developers (together with Henri Casanova, Martin Quinson, and Frédéric Suter) of this project. The SimGrid project is hosted on the INRIA gforge and is freely available. SimGrid is highly scalable and can simulate several millions of nodes on a single machine while using realistic network models, whose soundness was assessed through thorough (in)validation studies. SimGrid can also be used as an MPI Simulator to realistically simulate unmodified MPI programs.

SimGrid is recognized in the HPC community as one of the most prominent simulation environments as shown by its large community of users and the number of publications that use it: in the past ten years, SimGrid has been used for publishing at least 140 papers.

SimGrid is an open-source project available at:

<http://simgrid.gforge.inria.fr>

## Pistou: a Bibliography Management Tool

I was asked by the direction of the LIG in 2006 to design a tool that would allow the LIG to collect and collaboratively manage the bibliography data required for the quadrennial AERES evaluation of the laboratory. By this time, HAL was not suited at all for such purpose. I designed and helped implementing such a tool with Émile Morel and Isabelle Guillet.

<http://pistou.imag.fr>

This open-source software allowed us to collect within a few months a relatively good quality bibliography database containing more than 10 000 entries. This tool is still in use today although the LIG teams are strongly encouraged to migrate their bibliography management to HAL.

## Scientific Collaborations and Grants

During these years I have been heavily involved in the following national or international projects, which I briefly describe here:

### Projects and Grants

**IPL HAC SPECIS (2016-2020)** High-performance Application and Computers, Studying Performance and Correctness In Simulation. I lead this Inria Project Laboratory, which is a 4 year funding from Inria. This is a joint project between 8 Inria teams and whose goal is to answer methodological needs of HPC application and runtime developers and to allow to study real HPC systems both from the correctness and performance point of view. To this end, we gather experts from the HPC, formal verification and performance evaluation community. All the resulting research developments will be integrated in the open source SimGrid framework so that they can benefit as quickly as possible to the greatest number.

**ANR SONGS (2012-2015)** Simulation Of Next Generation Systems, a 4 year ANR grant (IN-FRA, Programme Systèmes embarqués et grandes infrastructures; 2012-2015). This is a joint project with Martin Quinson, Lionel Eyraud-Dubois, Frédéric Vivien, Frédéric Suter, Stéphane Genaud, Adrien Lèbre, Olivier Dalle, Abdou Guermouche and their respective teams. The goal of the SONGS project is to extend the applicability of the SimGrid simulation framework from Grids and Peer-to-Peer systems to Clouds and High Performance Computation systems. Each type of large-scale computing system will be addressed through a set of use cases and lead by researchers recognized as experts in this area. I was leading the work package on Analysis and Visualization and very involved in all the work packages (experimental methodology, HPC, data grid, peer-to-peer and volunteer computing, cloud computing) where I played a transverse coordination role.

**European Mont-Blanc Projects (2011-2016)** Energy efficiency is a primary concern for the design of any computer system and it is clear that designing the envisioned Exascale systems within a reasonable power envelope will require to fully redesign software and architecture. Since October 2011, the aim of the European project called Mont-Blanc has been to design a new type of computer architecture capable of setting future global HPC standards, built from energy efficient solutions used in embedded and mobile devices such as ARMv8 64-bit processors. This project is coordinated by the Barcelona Supercomputing Center (BSC) and is funded by the European Commission. Two years later, the European Commission granted additional 8 million Euro funds to extend the Mont-Blanc project activities until September 2016.

My role in these projects is to improve performance evaluation and simulation techniques to conduct network and resource provisioning studies raised by such context as well as possibly improve the parallel software development process.

**ANR USS-SimGrid (2009-2011)** Ultra-Scalable Simulations with SimGrid, a 3 year ANR grant (ARPEGE, Programme Systèmes embarqués et grandes infrastructures; 2009-2011). This was a joint project with Martin Quinson, Fabrice Le Fessant, Lionel Eyraud-Dubois, Frédéric Vivien, Frédéric Suter, Olivier Flauzac and their respective teams. This project aims at extending SimGrid more specifically for the very large scale distributed computing (peer-to-peer, desktop grids, ...), at improving the quality of its results and at providing tools for experiments management and steering. In the long term, we aim at federating the various efforts at the national scale in the area of simulation for large scale distributed computing. I was leading the work package on design and implementation of scalable models and I was very involved in the work packages visualization and analysis, experiment campaign management.

**ANR DOCCA (2007-2010)** Design and Optimization of Collaborative Computing Architecture, a 3 year ANR grant for young researchers. This was a joint project with Corinne Touati and Florence Perronnin.

**ANR ALPAGE (2005-2008)** ALgorithmique des Plates-formes À Grande Échelle, a 3 year ANR grant. This was a joint project with Yves Robert, Anne-Marie Kermarrec, Pierre Freignaud, Olivier Beaumont, and their respective teams.

## **Collaborations and Joint Laboratories**

**Inria/Orange laboratory (2017-...)** The joint laboratory between Orange and Inria aims at reinforcing the research effort on network virtualization and on the convergence between communication networks and cloud computing (Fog, IoT, ...). I participate to this joint laboratory since the beginning of 2017 and coadvise a PhD thesis.

**Joint laboratory on *petascale* and *extreme-scale* computing (2011-2015)** The joint laboratory between University of Illinois at Urbana-Champaign, Inria, the CNRS, Argonne National Laboratory, Barcelona Supercomputing Center and Jülich Supercomputing Center targets software and hardware issues raised by the design and exploitation of supercomputers. I participate since 2011 to this joint laboratory in particular regarding modeling and performance evaluation topics.

In this context, I organized the summer school on *Performance Metrics, Modeling and Simulation of Large HPC Systems* funded by the Partner University Fund and the joint laboratory in June 2014 in Sophia Antipolis\*.

**Action d'Envergure Inria HEMERA (2010-2014)** HEMERA is an Inria research action, which started in 2010 and whose goal is to federate the research efforts linked to large-scale experimentation, particularly in the context of the Grid'5000 infrastructure. One of the goals of this action was to animate the high performance/distributed computing French research community. This project was lead by Christian Pérez and I was responsible with Martin Quinson of the {Modeling Large Scale Systems and Validating their Simulators} theme.

**Associated Team Inria MESCAL/Berkeley (2008-2014)** The MESCAL team has been associated to several researchers from the Bay area and in particular David Anderson, the leader of the BOINC project but also Walfredo Cirne from Google Inc. This collaboration was initially lead by Derrick Kondo and then by myself and focused on many performance evaluation aspects of very large scale computing systems such as volunteer computing systems and cloud computing systems. Derrick Kondo and Jean-Marc Vincent worked on statistically characterizing the availability and unavailability of resources in such systems based on traces collected by our American colleagues. Such models can then be used to predict load or improve replication strategies and collective availability. On my side I worked rather on how scheduling and game theory could be applied to possibly better understand such systems as well as on how to simulate them efficiently. This collaboration was initially lead by Derrick Kondo. I became the coordinator in 2012 and I organized the BOINC workshop in 2013.

**Grenoble - Porto Alegre Associated Team and Joint Laboratory** Grenoble and Porto Alegre Universities (in particular the Universidade Federal do Rio Grande do Sul) have a long standing collaboration that dates back from the end of the 1970s. There has been several associated teams and research/student exchanges (through Inria, CNRS, CAPES, CNPq, FAPERGS, ... ) and these collaborations have recently evolved into the LICIA (*Laboratoire International en Calcul Intensif et Informatique Ambiante*), a joint laboratory between the computer science department of UFRGS and the LIG. I have thus visited regularly Porto Alegre in the last decade to give lectures and collaborate with Philippe Navaux, Nicolas Maillard, Claudio Geyer, Alexandre Carrissimi. This gave me the opportunity to advise many Brazilian students during the Msc, PhD or postdoc among which Pedro Velho, Lucas Schnorr, Bruno Donassolo, Wagner Kolberg, Rafael Tesser, ...

## Teaching

I teach in the 2nd year of Master Research since I arrived in Grenoble in 2006 and I am co-responsible of the "Parallel, Distributed and Embedded Systems" option of the MOSIG (International Master of Science of Grenoble) since 2011. I am responsible of the Parallel Systems lecture in this option since 2008.

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\*[http://mescal.imag.fr/membres/arnaud.legrand/research/events/puf\\_jlpc\\_workshop\\_14.php](http://mescal.imag.fr/membres/arnaud.legrand/research/events/puf_jlpc_workshop_14.php)



I also worked several for the Ecoles Normales Supérieures to design and examine the competitive exam for admission. I designed the algorithm subject of the "second concours" in 2005-2006. I designed and examined exams for the "Épreuve Pratique d'Algorithmique et Programmation" of the "premier concours" from 2006 to 2009. I designed the computer science subject of the "first concours" in 2015.

In the last years, I have also been invited to give a series of lectures (about 15-18 hours) on Scientific Methodology and Performance Evaluation at the master level (in August 2015 at Federal University of Rio Grande do Sul, in December 2016 at ENS Lyon, ...)

Année	Intitulé	Public	Lieu	Durée			
2012-2017	Probability and Simulation Performance Evaluation	RICM4 (engineers M1)	INPG	20+20 hours per year			
2011-...	Scientific Methodology and Performance Evaluation	International Master of Science in Informatics at Grenoble (MOSIG) M2R	Université Joseph Fourier	15 hours per year			
2008-...	Parallel Systems (coordinateur + enseignant)	MOSIG M2	Université Joseph Fourier	8-18 hours per year			
2010-2011	Operating Systems	MOSIG M1	Université Joseph Fourier	32 hours per year			
2008-2009	Scheduling for Large Distributed Computing Systems	Master 2	UFRGS (Brésil)	9 hours per year			
2007-2010	Systèmes d'exploitation	Master 1	Université Joseph Fourier	6-9 hours per year			
2006-2008	Mesure et analyse de donnée pour l'évaluation de performance	Master 2 Recherche	Université Joseph Fourier	6 hours per year			
2006-2007	Architectures hautes performances	Master 2 Recherche	Université Joseph Fourier	8 hours per year			
2005-2006	Introduction à l'ordonnancement	Graduate Students	UCSD	2 hours			
1 <sup>er</sup> semestre 2003-2004 2 <sup>nd</sup> semestre 2002-2003 1 <sup>er</sup> semestre 2002-2003	Introduction à l'algorithmique <div style="display: inline-block; vertical-align: middle; font-size: 2em;">}</div> <div style="display: inline-block; vertical-align: middle; margin-left: 10px;">           courses            courses            courses, tutorials         </div>	DEUG SM/STPI/SV 2 <sup>nd</sup> year	UCBL	16 hours			
2003-2004 2002-2003 2001-2002				Algorithmique parallèle	Maîtrise	ENS Lyon	32 hours 32 hours 32 hours
2001-2002				Langage C	DEUG MIAS 2 <sup>nd</sup> year	UCBL	15 hours
2000-2001	Graphes, automates et langages formels	DEUG MIAS 2 <sup>nd</sup> year	UCBL	18 hours			
1999-2000	CAML	Spé MP et MP*	Lycée du Parc	2 hours per week over 8 months			
1998-1999 2000-2001	Colles de Mathématique	Sup PCSI	Lycée du Parc	2 hours per week over a year			

## Administrative Responsibilities

- Coordinator of one (Reproducible Research) of the 22 challenges of the 2018-2022 Inria Strategic Plan (2017).
- Coordination of the evaluation of the Parallel and Distributed Computing theme at Inria (2016).
- **Leader of the Inria POLARIS research team** (2016-...).
- Chargé de Mission by the CNRS of the "Distributed Systems, Parallel Computing and Networking" theme of the LIG (supervision of 2nd year PhD students, scientific animation) (2012-2015)
- Adjunct responsible of the Parallel, Distributed and Embedded Systems option of the Master Of Science in Informatics at Grenoble (2011-dots)

- Member of the CUMI (commission des moyens informatiques) of the LIG (2006-2013)
- Member of the webmasters working group for the LIG laboratory (2007-2013)
- Responsible of the seminars in the ID/LIG laboratory for the MESCAL/MOAIS/NANOSIM teams (2005 - 2015)

## Stays In Foreign Countries

During my career, I obviously traveled a lot and stayed many times a few weeks mostly in Porto Alegre (Brazil) and in the US (San Diego, Berkeley, Argonne, ...).

From November 2004 to October 2005, I worked at University of California, San Diego with Henri Casanova, Jeanne Ferrante and Larry Carter.

## Invited Talks

I regularly participate to conferences and summer schools to give keynotes and tutorials. Here is a **non exhaustive** list of such interventions:

- On reproducible research
  - Keynote (1 hour) at the LIG laboratory, Grenoble, March 2017.
  - Keynote (1 hour) at the PRECIS (Précision, Reproductibilité en Calcul Scientifique) Spring school, Fréjus, May 2017.
  - Keynote (2× 1 hour) at the Grenoble Data Science Institute, April 2017.
  - Keynote (1 hour) at the LIG laboratory, Grenoble, March 2017.
  - Keynote (1 hour) at the ENS Rennes, February 2017.
  - Talk (20 minutes) at Inria Scientific Days, Rennes, June 2016.
  - Keynote (1 hour) at the R<sup>4</sup> conference, Orléans, Dec 2015.
  - Keynote (1 hour) in the PLAFRIM working group in Bordeaux, December 2014.
  - Keynote (1 hour) International Workshop on Reproducibility in Parallel Computing, August 2014.
  - Lecture (3 hours) in the «Summer school on Performance Metrics, Modeling and Simulation of Large HPC Systems», June 2014.
  - Lecture (3 hours) for the European project «sync-free» in Paris May 2014.
  - Tutorial (2 hours) Conférence d’informatique en Parallélisme, Architecture et Système (COMPAS) in Neuchâtel, en mars 2013.
- On Simulation and Performance Evaluation
  - Keynote (1 hour) «Simulation of Large-Scale Distributed Computing Research» at the workshop du Laboratoire International en Calcul Intensif et Informatique Ambiante à Grenoble, September 2014.
  - Keynote (1 hour) «Simulation of Large-Scale Distributed Computing Research: The SimGrid Project» at the SimuTools conference, in Cannes, March 2013.
  - Tutorial (2 hours) «Simulation for Large-Scale Distributed Computing Research» given with Martin Quinson at the Conférence d’informatique en Parallélisme, Architecture et Système (COMPAS) in Grenoble, in January 2013.

- Tutorial (2 hours) «Simulation for Large-Scale Distributed Computing Research». CLCAR (Latin American conference on HPC), Brazil, in 2010.
  - Keynote (1 hour) «Simulation for Large-Scale Distributed Computing Research». Summer school ERAD, Brazil, in 2009.
  - Tutorial (3 hours) «Simulation for Large-Scale Distributed Computing Research» given with Martin Quinson at the CCGrid conference, Lyon, 2008.
  - Keynote (1 hour) «Simulation, Emulation and Experiments» at the GRID'5000 spring school, 2006.
- On Scheduling:
    - Talk on “Non-Cooperative Scheduling of Multiple Bag-of-Tasks Applications”, TU Wien Seminar in 2013.
    - «On the Impact of Platform Models» at the "École de Printemps d'Informatique Théorique" (EPIT) in 2007.
    - “Toward a Fully Decentralized Algorithm for Multiple Bag-of-tasks Application Scheduling on Grids” in CIRM workshop on “New Challenges on Scheduling Theory” in 2008.
    - “Scheduling Competing Regular Applications on a Heterogeneous Master-Worker Platforms” in the NSF/INRIA Workshop on “Scheduling for Large-Scale Distributed Platforms”, La Jolla, California, in 2005

## Publications

### International peer reviewed journal [ACL]

#### 2015

- [1] L. Staniscic, A. Legrand, and V. Danjean. An Effective Git And Org-Mode Based Workflow For Reproducible Research. *ACM SIGOPS Operating Systems Review*, 49:61 – 70, 2015.
- [2] L. Staniscic, S. Thibault, A. Legrand, B. Videau, and J.-F. Mehaut. Faithful Performance Prediction of a Dynamic Task-Based Runtime System for Heterogeneous Multi-Core Architectures. *Concurrency and Computation: Practice and Experience*, page 16, May 2015.

#### 2014

- [3] H. Casanova, A. Giersch, A. Legrand, M. Quinson, and F. Suter. Versatile, Scalable, and Accurate Simulation of Distributed Applications and Platforms. *Journal of Parallel and Distributed Computing*, June 2014.

#### 2013

- [4] R. Bertin, S. Hunold, A. Legrand, and C. Touati. Fair scheduling of bag-of-tasks applications using distributed Lagrangian optimization. *Journal of Parallel and Distributed Computing*, Aug. 2013.
- [5] P. Velho, L. Schnorr, H. Casanova, and A. Legrand. On the Validity of Flow-level TCP Network Models for Grid and Cloud Simulations. *ACM Transactions on Modeling and Computer Simulation*, 23(3), Oct. 2013.

## 2012

- [6] H. Kameda, E. Altman, C. Touati, and A. Legrand. Nash Equilibrium Based Fairness. *Mathematical Methods of Operations Research*, 76(1), 2012.

## 2011

- [7] L. M. Schnorr, A. Legrand, and J.-M. Vincent. Detection and analysis of resource usage anomalies in large distributed systems through multi-scale visualization. *Concurrency and Computation: Practice and Experience*, 2011.

## 2008

- [8] O. Beaumont, L. Carter, J. Ferrante, A. Legrand, L. Marchal, and Y. Robert. Centralized Versus Distributed Schedulers for Multiple Bag-of-Tasks Applications. *IEEE Trans. Parallel Distributed Systems*, 19(5):698–709, May 2008.
- [9] A. Legrand, A. Su, and F. Vivien. Minimizing the Stretch When Scheduling Flows of Divisible Requests. *Journal of Scheduling*, 2008.

## 2005

- [10] O. Beaumont, H. Casanova, A. Legrand, Y. Robert, and Y. Yang. Scheduling Divisible Loads on Star and Tree Networks: Results and Open Problems. *IEEE Trans. Parallel Distributed Systems*, 16(3):207–218, 2005.
- [11] O. Beaumont, A. Legrand, L. Marchal, and Y. Robert. Pipelining Broadcasts on Heterogeneous Platforms. *IEEE Trans. Parallel Distributed Systems*, 16(4):300–313, Apr. 2005.
- [12] O. Beaumont, A. Legrand, L. Marchal, and Y. Robert. Steady-State Scheduling on Heterogeneous Clusters. *Int. J. of Foundations of Computer Science*, 16(2):163–194, 2005.
- [13] A. Legrand, L. Marchal, and Y. Robert. Optimizing the Steady-State Throughput of Scatter and Reduce Operations on Heterogeneous Platforms. *Journal Parallel and Distributed Computing*, 65(12):1497–1514, 2005.

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