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DETAILED CURRICULUM VITAE

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# Synthesis

## **Current position**

Full Professor, Department of Computer Science at the University Toulouse 3 Paul Sabatier, France

Vice-President in charge of IT at University Toulouse 3 Paul Sabatier

Chair of the SEPIA team at IRIT Laboratory

## **Teaching**

Algorithmic, Object Oriented Programming, Operating Systems, Distributed Systems, Computer Networks, Cloud and Grid Computing, Security

## **Research interests**

Energy-aware distributed computing, Distributed computing (Grid, Cloud), Virtualization, Security, Trust, Pervasive Grids, Data Grids, Pervasive Systems, SmartGrids

## **Publications**

8 editions of Journals, 9 editions of Proceedings, 20 Journals, 84 international conferences and workshops, 1 Book edition, 15 Book Chapters

## **Students Supervising**

2 PhD students (+11 already defended).

## **Conference organization, Program Chair**

ITC Specialist Seminar on Energy Efficient and Green Networking 2013

Workshop on Energy Efficiency in Grids, Clouds and Clusters (E2GC2) at Grid'2009 and Grid'2010

First Symposium on Pervasive Grids, PerGrid 2008

VLDB Workshop : Data Management in Grids DMG'05, DMG'06, DMG'07

IEEE ICPS'06 : International Conference on Pervasive Services 2006 French conferences : NOTERE 2012, RenPar'2009, Toulouse'2009, Ubimob 2008 and 2011

## **Steering Committees**

Int. Conf. on Pervasive Services (IEEE ICPS 2007-2010)

RenPar, ComPas (2009-2015)

## **Program Committees**

More than 30 Program Committees, among which CCGrid, CLOSER, Grid, e-Energy, GreenCom, ena-HPC, Globe, ...

## **Editorial Board**

Springer Scalable Computing Journal (since 2013)

Sustainable Computing : Informatics and Systems, Elsevier (since 2010)

Cluster Computing Journal, Elsevier (since 2006)

## **Projects coordination**

European COST Action IC0804 "Energy Efficiency in Large Scale Distributed Systems" (2009-2013)

National French Research funding : ANR DATAZERO (2015-2019), ACI Geno Medical Grid (2004-2007)

University funded project : IAPA (Infrastructure to Access, Process and Analyse biomedical data (2007-2009)

Regional Grant : Serber : pedagogical platform for networks security (2003-2005)

### **Projects participation**

European Projects : 4 past European projects, 1 running : European COST Action IC1305 NESUS "Network of researchers in Sustainable Computing" (2014-2018)

French Research funding : 6 past national projects

INRIA Research Projects : 2 past funded projects

CNRS Research Projects : 1 running : France Grilles / CloudMIP (2012-...)

### **Other International collaborations**

Computer science graduate school in Ethiopia (Addis-Ababa, 2005), then PhD program (2008-...)

Participation in EGEE (group JRA3/Security, 2005-2006) and formerly DataGrid.

Global Grid Forum, groups Data Access and Integration, Metadata and UbiGrid (up to 2006)

Bilateral projects with Austria (Univ. Vienna, 2006-2007 and 2009-2010)

### **Collective responsibilities**

Chair of the Computer Science School, University Littoral-Coôte-d'Opale (1998-2000)

Chair of the Computer Science Master, University Toulouse 3 Paul Sabatier (2010-2012)

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## 1 Current position

I serve as a Full Professor at the University Toulouse 3 Paul Sabatier, France, since September 2006. Before that, I was an Associate Professor at School of Engineering INSA in Lyon (2001-2006), before at the University Littoral-Côte d'Opale (1997-2001).

I am teaching at the Computer Science department, and my research is done at the IRIT laboratory (CNRS UMR 5505). I am chairing the SEPIA team dedicated to Distributed Systems (30 researchers).

From 2004 to 2006 I had a temporary full researcher position at CNRS (French National Center for Research). In 2012, I had a 6 month granted period for researching only (no teaching, CRCT).

## 2 University Achievements

- 17 November 2005 : **Accreditation to supervise research** : *A Pervasive Grid, seen from the data side*. INSA Lyon and University Claude Bernard-Lyon 1.
- 93-96 : **PhD in Computer Science** : *Data driven load balancing : application to image synthesis*, defended October 3rd, 1996, with honors, supervised by Prof. S. Miguet, Professor. PhD from Ecole Normale Supérieure de Lyon, LIP laboratory.
- 1993 : **Master in Computer Science**, ENS-Lyon and University Claude Bernard-Lyon 1, with honors

## 3 Research activities (after PhD)

### 3.1 Distributed visualization : works in Laboratoire d'Informatique du Littoral (LIL) in Calais (1997-2001)

After finishing my PhD in image synthesis and parallelism, I joined the visualization team in Calais. I worked on a distributed visualization platform performing common algorithms like surface extraction, volume rendering, and so on. The **CompoVis** architecture was based on software components that could be combined by an end-user to construct a visualization pipeline. Specific visualization services relied on basic services for the launching, the placement, the security and concurrent accesses. Transparency for the end-user was achieved through a light web interface where only visualization services were accessible, hiding the complexity of the underlying distributed

system. One difficult problem of this kind of platform concerns the scalability issue. Thus, we worked on a near-automatic integration of new visualization services, relying on the VTK library.

These works produced 6 publications, and 1 collaboration with regional industrial firms to visualize the air pollution (Opal'Air group).

### **3.2 Data management in large scale distributed systems : works done at LI-RIS laboratory (UMR CNRS 5305) at INSA Lyon (2001-2006), and IRIT laboratory (UMR CNRS 5505) at University Toulouse 3, Paul Sabatier (2006-2010)**

My arrival at INSA Lyon created a new research axis : **data management for grid computing**. The different works exposed hereafter lead to 35 publications between 2002 and 2008 (7 journals), and several funded projects (ACI Medigrind, ACI Datagraal, ACI Darts, RagTime, ACI Geno Medical Grid), University project IAPA, and two bilateral collaboration projects with the University of Vienna, Austria.

**Data access** : Our first works concerned medical data sharing and computing, where data is produced and managed in hospitals. The DM<sup>2</sup> (Distributed Medical Data Management) architecture was conceived to use the grid for time and space consuming medical imaging operations. These developments were performed in the European DataGrid project, during the PhD thesis of H. Duque, in collaboration with CREATIS laboratory.

**Data adaptation** : The idea is to adapt the content to its usage context, in terms of network connectivity, user preferences, or terminal properties. We proposed a formal definition of an adaptation path, combined with a prototype based on web services (PhD of G. Berhe).

**Data caches** : The different users of a grid can be grouped, statically or dynamically, in communities (as a function of their geographical location, their data usage, ...). We proposed to analyze the semantic content and the usage of the data to increase the efficiency of the cache replacement. We investigated also the possibilities offered by active networks to push the cache management to the core of the network, minimizing the network load and memory need on the routers. We designed an architecture for collaborative caches adapted to data grids (PhD of Y. Cardenas), to aggregate resources so that users perceive an unique logical cache storage space.

**Security** : In the medical context, data security must be handled precisely to convince the different medical actors to use the computing grids. We worked in two directions during the PhD of L. Seitz : First, we proposed a role-based access control, that offers delegation of rights, ad-hoc and offline permissions granting. Second, we developed an encrypted storage mechanism, based on distributed secret sharing. Another work concerns access security, and more precisely authentication, based on trust management and propagation (PhD of R. Saadi). We proposed the X316 certificate that ensures the potential adaptability of authentication information to its context of usage, and that embeds some propagated trust values allowing for a broader access to unknown sites. In parallel, we worked on the impact of the subjectivity of trust in trust propagation (PhD. of O. Hasan, collaboration with Purdue University, USA).

**Definition of Pervasive Grids :** Many problems are common to data-grids and pervasive information systems, as many works in these fields corroborate : content management, replication, cache, security and data mediation are common interests in the two communities. We proposed in a collaboration with Rutgers University a definition of a **Pervasive Grid** integrating the mobile or nomadic access to the pertinent, available, contextualized information, using underlying grid services to perform a number of tasks (from storage to computation).

**Decision Making help on Grids :** We explored the way to efficiently represent the resources available on the grid, computing flexible network distances, where distances represent a given interest at a given time, and may vary with time (PhD. of J. Gossa). The NDS (Network Distance Service) aggregated multiple heterogeneous metrics to provide a user centric view of the resources of the grid. We studied the optimized placement of resources and the selection of best ones for particular cases when several replica exist.

### **3.3 Energy efficiency in large scale distributed systems : on-going work at IRIT Laboratory, University of Toulouse 3 Paul Sabatier (2008-...)**

When arriving in Toulouse, I created a research group (3 Associate Professors, 1 Engineer, 1 PostDoc, 10 PhDs, several masters students) on **Energy efficient distributed computing**. Since Grids and Clouds are consuming an enormous amount of electricity to run, our interest lies in the mean to reduce this ecological, economical and societal impact. Our main findings are on the following topics :

- On the modeling of the energy consumption, from the measurements, mathematical modeling of consumed energy by applications et IT systems, to the profiling of system and software based on their energy consumptions (PhD. of L. Fontoura Cupertino, PhD. of G. Landry Tsafack Chetsa, collaboration with INRIA-Lyon, France and University of Vienna, Austria)
- On task allocation on clusters, favoring consolidation with respect to quality of services constraints and energy minimization, also taking into account DVFS possibilities and task migration with virtual machines (PhD. of D. Borgetto, collaboration with University of Hawaii at Manoa, USA and Technical University of Vienna, Austria)
- On energy-proportional computing on heterogeneous clusters (PhD. of V. Villebonnet, collaboration with INRIA-Lyon, France)
- On Virtual Machines scheduling in Clouds, using a distributed decision mechanisms without centralized view of the clouds (PhD. of T. Chekhou)
- On thermal-aware task scheduling of Cloud and HPC applications (collaboration in the CoolEmAll project)
- On the management of content delivery networks (CDN), taking into account response time vs energy tradeoff. (PhD. of S. Ul Islam and collaboration with University of Thessaloniki-AUTH, Greece)
- On the autonomic adaptation of the applications and system as a function of resources availability and energy consumption (PhD. of A. Gadafi)

- On the modeling of GreenIT innovation transfer with Multi-Agent-Systems (PhD. of C. Herzog, collaboration with INRIA-Lyon, France)
- On energy-aware data management for OLAP and MapReduce (cooperation with J. Song, NorthEastern University, Shenyang, China)

We have several partnerships in France, Europe and abroad on this theme, notably thanks to the COST Action IC0804 on Energy Efficiency in Large Scale Distributed Systems, that I was chairing until 2013, followed now by COST Action IC1305 NESUS on Sustainable Computing (2014-2018).

The works in this topic lead to 8 journals, 1 book, 8 book chapters, 30 conferences and 5 funded projects : ANR DATAZERO (2015-2019), FP7 CoolEmAll (2011-2014), ANR SOP (2011-2014), INRIA ARC "Green-Net" (2008-2009) and ANR-JST FP3C with Japan (2010-2013).

I am member of the standardization body ISO (AFNOR French branch), and more specifically I participate to the ISO/IEC Joint Technical Committee JTC1/39 on Energy efficiency of Datacenter since 2012. In the same direction, I participated in several GreenGrid EMEA group meeting during the last years.

Following my previous works on Data Management in Grids, I continued my activities on Grid and Distributed Computing in general (not related especially to energy). The project PIREGRID, funded by the European FEDER (2009-2012) aimed at providing computing resources and expertise for SME at the regional level (collaboration with Spain). The followup on this aspect is a CNRS funded project for the federation of Clouds, namely CloudMIP. Its objective is to build a federation of Clouds from different middleware and to insure the interoperability of the infrastructure, as well as its energy consumption monitoring.

### 3.4 Publications

A complete list can be retrieved as an annex of this document, and from the Internet at : "<http://www.irit.fr/~Jean-Marc.Pierson/BIB>".

Details : 8 editions of Journals, 9 editions of Proceedings, 20 Journals, 84 international conferences and workshops, 1 Book edition, 15 Book Chapters

### 3.5 Supervising of students

#### PhD supervising (13)

- October 2002-July 2005 : PhD thesis of Ludwig Seitz (co-supervised with Pr. L. Brunie, INSA-Lyon). L. Seitz work was focused on security management in grids, and more precisely in bio-medical grids where the security factor is very critical. He contributed in two directions : role based access control, and distributed encrypted storage. He received a grant from the French research ministry. He defended his PhD in July 2005, and he is now working as vice-head of the Lund-based SICS laboratory in Sweden. These works lead to publications in 2 Journals and 5 international conferences.



- September 2002-September 2006 : PhD thesis of Girma Berhe (co-supervised with Pr. L. Brunie, INSA-Lyon). G. Berhe worked on content adaptation in pervasive information systems. He received a grant from the French foreign ministry to make his PhD. He defended his PhD in September 2006 and is now a PostDoc in Luxembourg. His thesis leads to publications in 1 Journal and 4 international conferences.
- September 2003-December 2007 : PhD thesis of Yonny Cardenas (co-supervised with Pr. L. Brunie, INSA-Lyon). The subject of his thesis is the development of collaborative cache management in grids. He received a grant from the Rhône-Alpes Region, with the help of the SunLabs research laboratory of Sun Microsystems. He defended his PhD in December 2007, and is now a research engineer at the CNRS IN2P3 Laboratory in Lyon. His work leads to publications in 1 Journal, 1 international conferences and 1 French speaking conference, 2 workshops and 1 book chapter.
- September 2004-December 2007 : PhD thesis of Julien Gossa (co-supervised with Pr. L. Brunie, INSA-Lyon). J. Gossa worked on data placement and replication in biomedical data-grids. His grant comes from the French research ministry, and was associated to the Geno-Medical Grid project. He is now an Associate Professor at University of Strasbourg. His publications include 2 Journals, 5 international conferences.
- October 2004-January 2009 : PhD thesis of Rachid Saadi (co-supervised with Pr. L. Brunie, INSA-Lyon). The thesis of R. Saadi is related to the security in pervasive environments. R. Saadi received a grant from the Algerian government and is now working in a Startup. His work lead to publications in 1 Journal, 6 international conference.
- October 2006-September 2010 : PhD thesis of Omar Hasan (co-supervised with Pr. L. Brunie, INSA-Lyon). O. Hasan worked on subjectivity in trust propagation. O. Hasan received a grant from the Pakistan government. He is now a Associate Professor at INSA-Lyon. His publications include 6 international conferences.
- October 2009- June 2012 : PhD of Damien Borgetto (co-supervised with Dr. G. Da Costa, IRIT/UPS). D. Borgetto works on energy-aware task allocation in clusters. He received a grant from the French research ministry and is now a PostDoc at IRIT. He published in 1 Journal, 2 book chapters and 4 international conferences.
- January 2011- December 2013 : PhD of Landry Tsafack (co-supervised with Dr. L. Lefevre, LIP/ENS-Lyon). L. Tsafack works on energy profiling of applications. He received a grant from the INRIA Hemera initiative and is now a PostDoc at ENS-Lyon. His work lead to publications in 2 Journals, 1 Book chapter and 5 international conferences.
- January 2011- July 2014 : PhD of Thiam Chekhou (co-supervised with Dr. G. Da Costa, IRIT/UPS). T. Chekhou works on energy aware job placement with distributed approach. He received a grant from the Senegalese government and he is now Assistant Professor in Senegal. His work lead to publications in 1 Book chapter and 3 international conferences.
- January 2010-January 2015 : PhD of Saif Ul Islam. S. Ul Islam works on energy efficiency in content delivery networks. S. Ul Islam received a grant from the Pakistan government and

he is now Assistant Professor in Pakistan. His work lead to publications in 2 international conferences.

- January 2012-September 2015 : PhD of Leandro Fontoura Cupertino (co-supervised with Dr. G. Da Costa, IRIT/UPS). L. Fontoura Cupertino works on the modeling of energy consumption with machine learning techniques. His grant comes from the FP7 CoolEmAll project. He is now working in industry. His work lead to publications in 3 Journals, 1 Book chapter and 1 international conference.
- January 2011-November 2015 : PhD of Christina Herzog (co-supervised with Dr. L. Lefèvre, LIP/ENS-Lyon). C. Herzog works on the modeling of innovation transfer in GreenIT with multi-agent-systems. Her grant comes from the FP7 CoolEmAll project. She funded her own company. Her work lead to publications in 2 Book chapters and 5 international conferences.
- Sept 2013-... : PhD of Violaine Villebonnet (co-supervised with Dr. L. Lefevre, LIP/ENS-Lyon). V. Villebonnet works on energy-proportional computing with heterogeneous platforms. Her grant comes from the INRIA Hemera initiative. Her work lead to publications in 1 Journal and 2 international conferences.

### 3.6 Projects / National collaborations

Underlined are the ones I am/was coordinating.

National ACI GRID Program : Project DARTS : deployment and administration of software components on the grid. Period : 2002-2004. Grant : 12.5 K-euros for the team.

National ACI GRID Program : Project MEDIGRID : medical image management on grids. Period : 2002-2005. Grant : 75 K-euros for the team.

National ACI GRID Program : Project DATAGRAAL : organizing the French community interested in data management in Grids. Period : 2002-2004. Grant : 12.5 K-euros for the team.

National ACI Grid "Grid5000" : The Grid5000 platform is a national project to construct a 5000 nodes grid in France. I was the entry point of this project in the LIRIS laboratory. Period : 2003-2006. Grant : none. This project extended with the ALLADIN project in which i am also involved, still without funding.

Regional RAGTIME : medical information management in grids. Period : 2003-2006. Grant : 7 K-euros for the team.

National ACI GMG (Geno-Medical Grid). The goal of the project is, on top of a grid infrastructure, to propose a software architecture able to manage heterogeneous and dynamic data stored in distributed warehouses for intensive analysis and processing purposes. Period : 2004-2007. Grant : 78 K-euros for the team, (total : 208 K-euros), one PhD grant for 3 years, 12 months PostDoc and 12 months engineer.

University IAPA project (Infrastructure to Access, Process and Analysis of biomedical data). The project aims at correlating available data in order to find some invisible links between data. The target is cancer and we work in association with the ICR medical clinic and researchers in Toulouse. Period : 2007-2009. Grant : 20 K-euros, one PhD grant for 3 years, one PostDoc

for 15 months.

National ARC-GreenNet. This project, funded by INRIA, aimed at creating a software infrastructure for grids that is efficient in energy consumption. Period : 2008-2009. Grant : 20 K-euros and one PostDoc for 12 months (shared with LIP/ENS-Lyon).

National AE-HEMERA. This project, funded by INRIA, aims at organizing and developing research on the ALLADIN/Grid5000 infrastructure. Period : 2010-2014. Grant : 2 PhD for 3 years (shared with LIP/ENS-Lyon).

National ANR-JST FP3C. This project aims at designing software infrastructure for post-petascale architectures. In particular, we are in charge of the energy-awareness. Period : 2010-2013, Grant : 90 K-euros for the team.

National ANR SOP. This project concerns the development of new runtime models for personal users : The user does not manage his/her machine but subscribe a rent providing him with a light computer connected to the provider. In particular, we are in charge of the energy-awareness and autonomic computing. Period : 2011-2014, Grant : 230 K-euros for the team.

National ANR DATAZERO. This project aims at studying Datacenters partially powered by direct current coming from renewable energies. Period : 2015-2019, Grant : 250 K-euros for the team.

### 3.7 Projects / International collaborations

University of Vienna, Austria Since 2005 we develop bilateral projects on the prediction of the network load and its usage by the users to optimize the placement of the data replicas (related to J. Gossa PhD, with Dr. K. Hummel in Vienna). This collaboration lead to 1 publication in a international conference. For 2009-2011, we renewed the collaboration in enlarging the focus of the project to dynamic mobile users and servers and on the prediction of the energy consumption.

Technical University of Vienna, Austria In the context of the PhD of D. Borgetto we worked on the autonomic management of Clouds, in particular concerning the virtual machines resources allocation. We published one conference paper on this collaboration.

Addis Ababa, Ethiopia I participated in the creation of a graduate program and laboratory at the Computer Science Department, University of Addis-Ababa, Ethiopia. In 2003 I gave Master course on distributed systems and grid computing. In 2005 we proposed 3 joint master research projects, supervised by Ethiopian colleagues and myself. These projects lead to publications in international conferences. Since 2008, I am participating in the PhD program in Information Technology, the first of its kind in Ethiopia (and Eastern Africa), and I am mentoring 2 PhD. students.

SICS, Sweden We have been collaborating with the SICS laboratory at KTH University in Stockholm. L. Seitz (former PhD student) visited in 2004. The subject of the collaboration was to link the Delegent system developed in Sweden with our access control on grids. We participated in the group on security (JRA3) of the European project EGEE (Enabling Grids

for E-science in Europe) which adopted partly our proposal of distributed storage of decryption keys for a secured storage.

University of Innsbruck, Austria In Nov-Dec. 2006, I visited the DPS group (Distributed and Parallel Systems), lead by Prof. T. Farhinger. The subject of the work was about cache management techniques in Grid.

Rutgers University, USA I collaborated with M. Parashar at Rutgers University, USA, on the Pervasive Grid concept (1 international conference, 1 book chapter).

European Project FEDER "PIREGRID" The PIREGRID project aims at creating a computing grid within South-West France and North Spain. Funded by the European FEDER program (Grant : 130 K-euros for IRIT), it aims at attracting SME to Grid and Cloud Computing. Period : 2009-2012.

European COST Action "IC0804" Period : 2009-2013. I was chairing the European COST Action IC0804 on "Energy Efficiency in Large Scale Distributed Systems". This Action aims at structuring the research in this field in Europe (and associated countries). As of today, 23 countries and 6 Non-COST institutions (2 from USA, Canada, Australia, New Zealand, India) participate in the Action. Meetings normally attract between 50 to 70 researchers to discuss different topics on this subject. Within the framework on this Action, we set several collaborations and researchers exchanges from/to our laboratory in Toulouse : University of Vienna and Technical University of Vienna, Austria ; Luxembourg University ; AUTH, Greece ; University of Hawai at Mano'a, USA. I am invited at several seminars and workshops in Europe on this subject and as Expert by the European Commission at several events.

European Project "CoolEmAll" Period : 2011-2014. COOLEMALL is a FP7 STREP project that aims at providing advanced planning and optimization tools for modular data center environments. The project develops a suite of tools to optimize the construction and the operation of datacenters. Grant : 450 k-euros for the team.

European COST Action "IC1305" Period : 2014-2018. I am participating in the European COST Action IC1305 on "Sustainable Computing". I am member of the Management Committee of the Action. This Action aims at structuring the research in the field of exascale computing in Europe (and associated countries).

NorthEastern University, Shenyang, China . Since 2012, we have some strong links with J. Song, formerly a PostDoc in the team, now an Associate Professor in China. We are collaborating on energy-aware data management for OLAP and MapReduce. This collaboration lead to 1 publication in chinese and 1 in english.

University of Hawai at Mano'a, USA In Dec. 2010 and May 2013, I visited Prof. H. Casanova. We are collaborating on several aspects related to energy-aware task allocation and scheduling. This collaboration lead so far to 1 Journal, 1 conference and 1 book chapter.

### 3.8 Projects / Industrial collaborations

I participated in 3 projects in the environmental theme : I worked with two agencies funded by industrials for the visualization of the air pollution, in Calais (Opal'Air, 2000-2001), and in Lyon (Coparly, 2001-2002). We studied for the AFSEE (French Agency for Environmental and Health Security) the possibilities to create a data-grid to integrate all the data sources related to the soil pollution.

Between 2003 and 2006, I helped a startup (3DDL, 3 Degreès De Libertée), created by former INSA students. We obtained a grant from the Rhône-Alpes Region to collaborate on the dynamic adaptation of services (games, video, ...) on mobile phones. This work was related to G. Berhe PhD, and leads to 2 publications in international conferences.

We had strong links with SunLabs Europe. SunLabs was the industrial partner of Y. Cardenas for his PhD grant, in the RagTime project.

Several links are built with industrial partners (large groups and SMEs- involved in accepted or proposed projects : Fujitsu, Bull, IBM, Orange, Oxalya, Eaton, ... that were described in the previous section.

### 3.9 Edition / Organization / Program Committee

I am a member of more than 30 Program Committees, among which CCGrid, CLOSER, Grid, e-Energy, GreenCom, ena-HPC, Globe, ... The complete list is on my website.

Since 2006, I am a member of the Editorial Board of the Springer Cluster Computing Journal and since 2010 of the Elsevier Sustainable Computing (SUSCOM) Journal. Since 2013, I serve in the editorial board of the Springer Scalable Computing Journal.

I was the co-editor (with R. Laurini) of a special issue of the Journal "Networking and Information Systems" on "Pervasive information systems" (Volume 9, (2), 2004).

I organized (2005-2007), a satellite workshop to VLDB (Very Large Data Bases), on Data Management in Grids (DMG'05, DMG'06, DMG'07). I was the editor of the proceedings (Springer Verlag LNCS 3836 in 2005). In 2006 and 2007, a selection of the best papers were published by the Int. Journal "Concurrency and Computation : Practice and Experience".

In 2006 I organized (local arrangements-120 attendees- and program co-chair with L. Lefèvre, INRIA/LIP), the third IEEE ICPS conference (International Conference on Pervasive Services). A selection of the best papers were published by the Int. Journal "System and Software".

In September 2009, I organized (local arrangement, 150 attendees) the 19th Joint French-Speaking conference on Parallel Computing (RenPar), Operating Systems (CFSE) and Architecture (Sympa), serving also as the Program Chair for the RenPar conference at this 3 days-event.

In 2008 and 2011, I was TPC Chair of the Ubiquity and Mobility conference, Ubimob 2008 and Ubimob 2011.

In 2009 and 2010, I was TPC Chair of the Workshop on Energy Efficiency in Grids, Clouds and Clusters at Grid'2009 (E2GC2'2009) and Grid'2010 (E2GC2'2010), with proceedings included in

the Grid proceedings book.

In 2011, I was TPC Chair of the International Workshop on Sustainable Internet and Internet for Sustainability (SustaInet 2011) at 12th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks, WOWMOM 2011, Lucca, Italia,

In 2012, I served as TPC Chair of the NOTERE conference, with proceedings published by CÈpadues.

In April 2013, I was the General Chair of the EE-LSDS (Energy Efficiency in Large Scale Distributed Systems), that served as the final event of the COST IC0804 Action mentioned earlier. The proceedings have been published by Springer as LNCS. Two special issues that I co-edited will appear in Int. Journal "Concurrency and Computation : Practice and Experience" and in 'Sustainable Computing' Journal.

In November 2013, I was TPC Chair of the ITC Specialist Seminar on Energy Efficient and Green Networking (Nov 2013), Christchurch, New Zealand.

I am the editor of the book "Large-Scale Distributed Systems and Energy Efficiency : A Holistic View" published in May 2015 by John Wiley and sons. This book is made of 10 chapters and gathers the expertise of 65 researchers from the COST Action IC0804.

## 4 Teaching activities

### 4.1 Short introduction to my teaching activities

In 1996 I started my academic career as a lecturer in Strasbourg at the Louis Pasteur University, where I learnt a lot concerning the teaching of computer networks. I have been recruited as an assistant professor in 1997 at the University "du Littoral-CÙte d'Opale", in Calais, where I took the responsibility of all the network courses in the department of computer science. Being an associate professor at INSA de Lyon between 2001 and 2006, I shared my teaching duty on algorithms, object oriented programming languages and computer networks. Between 2002 and 2006, I also taught in the doctoral school at INSA, where I give a course entitled : "Grid Computing : from computation to data management". Since September 2006 I teach Computer Networks, Operating Systems, Distributed Systems and Security in Toulouse. I am chairing the pedagogical team on Operating Systems.

I gave some courses in English for international teaching projects, at the European scale (e-Learning, Genius and eTutor, see below), and at the University of Addis-Ababa in Ethiopia.

My teaching activities are held in synergy with my research activity. For instance, the network and operating systems courses cover topics from the physical layer to higher layers close to distributed systems, web services, cluster, cloud and grid computing.

The following sections will detail these activities, in terms of student level and hours, since 1997.

## 4.2 Bachelor degree

- University "Littoral Côte d'Opale" in Calais (Assistant professor, 1997-2001 ) :

*The following courses have been created from scratch. Indeed, the computer science school (IUP GMI) was created during my period of time in Calais. The hours given are annual.*

<b>Computer Networks</b>	60h
<b>Object oriented programming</b> (Java and Smalltalk)	60h

- Computer Science department at "INSA de Lyon" (Associate Professor, 2001-2004 ) :

*The hours given are annual.*

<b>Object oriented programming</b> (C++)	140h
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This course addresses the development and the programming with the object oriented paradigm, using C++ as the underlying language. It constitutes for most of the students a first experience in programming, thus it covers basic algorithmic (data structure, sort algorithms, notions of temporal and spatial complexity) as well as advanced C++ pits and traps. Differences with Java are also mentioned at the end of the course.

- Computer Science department at "University Toulouse 3" (Professor, 2006- ) :

*The hours given are annual.*

<b>Operating Systems</b>	30h
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This course addresses the organization of operating systems : processes, memory, stack, files, ...

<b>Computer networks</b>	30h
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The course addresses the basis of networks focusing on the network layer of the OSI pancake.

## 4.3 Master degree

- University "Littoral-Coôte d'Opale", in Calais :

*The following courses have been created from scratch. Indeed, the master degrees were created during my period of time in Calais. The hours given are annual.*

<b>Computer networks</b>	54h
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<b>Distributed systems</b>	50h
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<b>Advanced Computer networks</b>	30h
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<b>Local System/Networks management</b> (Linux)	15h
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<b>Network/Internet management</b>	30h
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- Computer Science department at "INSA de Lyon" (Associate Professor, 2001-2004) :  
*The hours given are annual.*

<b>Computer networks</b>	100h
This course addresses the basis of networks (OSI, TCP/IP), starting from layer 3 (Networking) for the Master degree. We also cover advanced notions like network management, network security and wide area networks. This course has been re-structured since my arrival in Lyon. We add in the traditional course a dedicated project by groups of 6 students, which is presented by those students to the whole class. I have also constructed a lab session with the Arkoon company for firewall solutions. Finally, we have also asked some industrial partners (France Telecom, Arkoon, ...) to give special sessions during the course.	

- Computer Science department at "University Toulouse 3" (Professor, 2006- ) :  
*The hours given are annual.*

<b>Computer networks and Distributed Systems</b>	60h (until 2011)
The course addresses advanced notions on networks (long distance, wireless, mobility issues). It also covers OSI layers from session to presentation to applications, as well as notion of distributed computing (RMI, Corba).	
<b>Multimedia networks</b>	15h (until 2011)
The course addresses specifically the notions in Computer Networks useful when dealing with multimedia applications, focusing on video and image communications and protocols.	
<b>Security in distributed systems</b>	30h (until 2011)
The course addresses issues of security in distributed systems, including cryptography, certificates, authentication, authorization, firewalling, attacks and security methodologies.	
<b>Distributed Systems design</b>	30h
Distributed systems design and implementation are covered, supported by practical sessions using Java RMI.	
<b>Large Scale Distributed Computing</b>	30h
This courses is an applied course on the usage of clusters, clouds and grid platforms, from the job scheduling and execution, using OAR and Globus on the Grid'5000 platform, and OpenNebula as our cloud middleware.	
<b>Mobile and Embedded software and system design</b>	30h
This course covers the practical issues of developing for constraints environments, with technical session dedicated to Android platforms.	



- Doctoral School of Lyon (2002-2006) :

**Grid Computing** 20h per year, with Lionel Brunie.

In this course, we address general aspects of Grid Computing and parallelism, before focusing on data management in grids. In a second part, the students work on research papers they have to study and present in the class. Papers, reports and presentations are put on a web site to enrich the course.

#### 4.4 Lifelong learning

**ENS-Lyon** : Solaris, Sun Microsystems (1996) 4 weeks

These sessions were dedicated to industrial learners, as one week intensive learning. The learners were there to discover the Sun Solaris operating system, from the user side or the management side (two kinds of sessions were organized).

**University "Littoral-Côte d'Opale"** (2000-2001) : Internet, Computer networks 6 weeks

These sessions were dedicated to a large public (from unemployed people to re-orienting student, ...), as one week intensive learning. The focus was put on practical sessions on using the internet and local area networks.

#### 4.5 E-learning

**Network and system management** 2\*20h

In the context of the European project GENIUS and eTutor (see section 5), I gave courses in English on networks and system management. This teaching was synchronous with about 40 students from 5 universities in Europe, and was coordinated with colleagues from these universities. It was mixing courses, exercises and even distant lab sessions, done in international and multicultural teams. This teaching was really pleasant and interesting on the various way to teach networks in Europe. The results of these projects, in terms of methodology and pedagogy, lead to publications in one international conference and one workshop.

**Security in systems and networks**

In the context of the SERBER project that I coordinate (see section 5), we have created a platform to teach the security aspects of systems and networks. The idea is to allow the learners to be hackers, victims or police-man during scenarios. The aim is not to help the student to become hackers, but rather to show them, by the mean of games and real life situation, the difficulty of the protection. The focus is set on the protection in the produced scenarios. The first session with this platform has been held at the beginning of 2006.

## 4.6 International teaching and Tutorials (PhD level)

**Distributed Systems, University of Addis-Abeba, Ethiopia, 2006 and 2011 : 30h**

This course presented the basis of distributed algorithms, as well as distributed programming (using MPI). It is part of a long term collaboration between our institute and the Addis-Abeba university, that offer to the best students a grant to start a PhD in our laboratory (Girma Berhe, one of my PhD student, got such a grant).

**Security, University of Addis-Abeba, Ethiopia, 2011 : 30h**

This course presented the basis of encryption, certificates, security management and models.

**Green Computing, University of Ca'Foscari, Italy, 2012 : 30h**

This course presented an holistic view on Green IT, from the perspectives of Networks, middleware, and software.

**Green Networks, RESCOM School, La Palmyre, France, 2011 : 6h**

This tutorial for PhD students was addressing green networking techniques and research trends.

**HPC and Energy Savings, IC0804 Training School, Vibo Valentia, Italy, 2013 : 3h**

This tutorial covered issues related to High Performance Computing and energy consumption and reduction.

## 5 Collective responsibilities : governance, research and teaching

### 5.1 Vice-President of University Toulouse 3 Paul Sabatier in charge of Information Technologies (2012-...)

Since 2012, I am in charge of IT governance in my University. In direct link with the President of the University, I cover the strategic issues related to several facets of IT software and infrastructure, for teaching, research and governance. About 150 staff members are directly in charge of IT in the University (for about 30000 students and 4700 staff members), working for infrastructures (datacenter, networks) and software levels (human resource management, salaries, students marks, web design and hosting, ...). Besides designing in cooperation with the President the strategy of IT developments, I also follow the operational aspects of strategic decisions on a everyday basis with more than 50 topics in parallel. This task is very time-consuming and challenging, but very interesting since it allows me to enter in detail in the university management structure. Part of the job is also to be the representative of the University in front of other universities, for the Ministry of Education and Research and with the economical and societal partners for all matters concerning IT.

## 5.2 Chair of the SEPIA team, IRIT (2010-...)

In 2010, we started a new research team dedicated to Distributed Systems. Composed of 11 permanent staff, 14 PhD students, 2 postdocs and 2 engineers, the team is working on several directions : autonomic systems, distributed file systems, distributed algorithms, and energy-aware computing. While my personal interests are in the latter, I am coordinating the whole team, in particular as the representative of the team towards the laboratory direction, for staff recruitments (including PhD. students), budgets, and offices. During these years we witnessed an increase in budget (about 1 million euros for projects), and in researchers (starting from 20 people we are now 30, not counting bachelor or master students working in the team).

## 5.3 Director of the Computer Science school, University Littoral-Côte d'Opale (1998-2000)

In Calais, I participated in the creation of the Computer Science school, delivering degrees up to Master level. I had been the first director of the school in 1998 (120 students) during 2 years. We convinced the University of the necessity of the school, which encountered a real success with many applications from students. This heavy task allowed me to meet the economic and politic actors of the Region, and was very fruitful for me. I had to handle many different tasks : moving the school to new buildings, organizing the new teaching team with the associated programs, managing the budget (which was shared with a Electrical Engineers school), ... I also invited industrial partners to join the evaluation committee of our computer science school.

## 5.4 Coordinating teaching projects

*For pedagogical details, please refer to section 4.5, I will detail here only administrative tasks*

I coordinated the participation of the INSA Lyon to the European e-Learning project GENIUS (2001-2003). This important project gathered 9 universities and 5 industrial partners. The aim of the project was to develop a new curriculum adapted to distance learning. This project lasted for 18 months (grant : 26 K-euros for INSA de Lyon). I recruited an engineer inside the project and additionally I organized the teaching with volunteer students. Following GENIUS, I initiated the European e-Tutor project (2004-2006, which was lead by a colleague at INSA de Lyon) which aims at tutoring the tutors in multi-cultural, synchronous and collaborative situations.

At INSA Lyon, I was the coordinator of the SERBER project. This project aims at building a platform for the teaching of security in systems and networks. This project received a two years funding (grant : 180 K-euros, 2003-2005, from the Region Rhône-Alpes). I lead the project, in terms of human resources and budgets with a development team of 6 people at its peak. I opened discussions with industrial partners (Arkoon network technology, Telindus, Exaprotect), and also government partners (police, justice), specialists in security and laws.

## 5.5 Coordinating research projects

The details of my participation in these projects can be retrieved in section 3. Here I only mention the administrative responsibilities :

- ANR DATAZERO (2015-2019) : Project coordinator and financial responsibility.
- ACI Geno-Medical Grid (2004-2007) : Project coordinator and financial responsibility.
- IAPA Infrastructure to Access, Process and Analyse biomedical data (2007-2009) : Project coordinator and financial responsibility.
- Bilateral project Amadeus (2006-2007 and 2009-2011) : Project coordinator with the University of Vienna in Austria.
- 3DDL : Project coordinator at LIRIS laboratory (2005-2006) for helping a startup company.
- European COST Action IC0804 (2009-2013) : Action Chair.

## 5.6 Other collective responsibilities

I participated in several juries for Phd defenses (38 as of today), being for some of them President of the Jury.

I was elected at the Council of the LIRIS Laboratory since its creation in 2003 up to 2006. In 2003 and 2004, I was also designated member of the Laboratory Committee.

From 2007 to 2010, I was elected at the Council of the Department of Mathematics and Computer Science at the University Toulouse 3 Paul Sabatier.

I was a designated member of commissions to recruit future associate professors at the Universities Franche-Comté and Lumière-Lyon 2 (2004-2006), and elected in University Toulouse 3 Paul Sabatier since 2010.

From 2009 to 2012, I was the Chair of Computer Science Master program. With about 300 students in the Master program grouped in 6 specialities, this task relates to the organization, logistics, diplomas and selection of teachers and students.

## 6 Languages

- French : fluent, mother language
- English : fluent
- Italian : advanced
- German : beginner
- Spanish : beginner

## 7 Leisure activities

- Sports : running, cycling, sky, football.
- Art : painting