

RÉSUMÉ

updated on October the 5th, 2022

1 Résumé

Personal coordinates

Name : THOMAS BEGIN
Birthday : April 30th, 1980
Citizenship : French
Marital status : Civil union, 1 child

Professional coordinates

Teaching : UFR d'Informatique, Bat. Nautibus
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Research : Research Team HoWNet
Laboratoire de l'Informatique du Parallélisme (LIP) UMR 5668
École Normale Supérieure de Lyon (ENS Lyon)
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69364 Lyon Cedex 07 - France
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Current position

Since 2021 **Head of the research team HoWNet**
LIP laboratory
UMR CNRS - ENS Lyon - UCB Lyon 1 - Inria 5668

Since 2009 **Assistant Professor - Université Claude Bernard Lyon 1 (UCBL)**
Computer Science
Laboratoire de l'Informatique du Parallélisme (LIP)
UMR CNRS - ENS Lyon - UCB Lyon 1 - Inria 5668
Research teams : HoWNet (2021-), Dante (2013-2021), Reso (2009-2013)

Former positions

- 2015-2016 **Visiting Researcher - University of Ottawa**
DIVA laboratory led by Pr. A. BOUKERCHE
As part of a CNRS research leave (one year stay)
Subject : Adapting source throughput and broadcasting video in vehicular networks
- Since 2009 **Assistant Professor - Université Claude Bernard Lyon 1 (UCBL)**
Computer Science
Laboratoire de l'Informatique du Parallélisme (LIP)
UMR CNRS - ENS Lyon - UCB Lyon 1 - Inria 5668
Research teams : HoWNet (2021-), Dante (2013-2021), Reso (2009-2013)
- 2008-2009 **PostDoc** at University of California, Santa Cruz (UCSC)
Jack Baskin School of Engineering
Fellow with Pr. A. BRANDWAJN
Subject : Proposing efficient algorithms based on the use of conditional probabilities to find the solution of complex queueing models
- 2005-2008 **Ph.D student** at the Université Pierre et Marie Curie (UPMC)
Laboratoire d'Informatique de Paris 6
Network and Performance Analysis team
Subject : Automatic Modeling and Calibrating of Systems
Teaching Assistant at Université du Val de Marne (UVM)

Diplomas and misc.

2019

: 19127200123

- 2018 **HDR from Université Claude Bernard Lyon 1 (UCBL)**
Guarantor :
Isabelle GUÉRIN LASSOUS (UCBL)
Specialization : Computer Science
Title : *Contributions to the Performance Modeling of Computer Networks*
Obtained on December 10, 2018
Members of the jury :
— André-Luc BEYLOT, Professor, Univ. Toulouse, Reviewer
— Andrzej DUDA, Professor, Univ. Grenoble Alpes, Reviewer
— Nihal PEKERGIN, Professor, Univ. Paris-Est, Reviewer
— Mohand-Saïd HACID, Professor, Univ. Lyon, Examiner
— Catherine ROSENBERG, Professor, Univ. of Waterloo, Examiner
— Fabrice VALOIS, Professor, Univ. Lyon, Examiner

- 2008 **Ph.D. from Université Pierre et Marie Curie (UPMC)**
Under the supervision of :
 Serge FDIDA and Bruno BAYNAT (UPMC)
Specialization : Computer Science, Telecommunication, and Electronics
Title : *Automatic Modeling and Calibrating of Systems*
 Obtained on December 5, 2008
 Awarded with : *Highest Honors*
Members of the jury :
 — Raymond MARIE, Professor, Univ. Rennes 1, Reviewer
 — Philippe NAIN, Directeur de Recherche, Inria, Reviewer
 — Alexandre BRANDWAJN, Professor, Univ. of California, Santa Cruz, Examiner
 — Philippe CHRÉTIENNE, Professor, Univ. Pierre et Marie Curie, Examiner
 — Bernd WOLFINGER, Professor, Univ. of Hamburg, Examiner
 — Serge FDIDA, Professor, Univ. Pierre et Marie Curie, Director
 — Bruno BAYNAT, Associate Professor, Univ. Pierre et Marie Curie, Director
- 2005 **Master of Computer Science - Specialization : Computer Networks**
 Université Pierre et Marie Curie (UPMC)
 Awarded with : *High Honors* (ranked 2nd)
- 2003 **Engineer Degree in Telecommunication and network**
 ISEP (Insitut Supérieur d'Electronique de Paris)
 Awarded with : *High Honors*
 5th year spent at **Michigan Technical University**

2 Teaching Responsibilities

- **Head of the Master 2 specialized in Systems and Computer Networks (SRIV¹) since June 2019** at UCBL.
- Coordinator for the **Research School** entitled "**Optimization and convexity**" held in ENS-Lyon in Winter 2013. Approximately 40 participants (PhD students and junior researchers) with the participation of J. Malick (Researcher CNRS) and C. Lemaréchal (Researcher Inria).
- **Elected member of the Computer Science Department council of UCBL** since March 2018.
- **Member of the Educational Commission of the Computer Science Department of UCBL** since March 2018.
- **Elected member of the Advisory Committee** for the department of Computer Science for UCBL since January 2012.
- Member of the **jury of Master 1** in Computer Science at the UCBL between 2010 and 2020.
- Head of the **jury of Master 2 SRIV** in Computer Science at the UCBL since 2019.
- Head of the **educational team Systems & Networks** at the UCBL since 2019 (member since 2010).

1. Systèmes, Réseaux et Infrastructures Virtuelles - <http://master-info.univ-lyon1.fr/SRIV>

- Presenting the academic degrees in Computer Science proposed by the UCBL at **salon de l'étudiant** held at Eurexpo, Lyon since 2016.
- Presenting the Master 2 SRIV of UCBL at **Salon Studyrama** .
- Assessing career promotion for Associate Professor in the Computer Science department of UCBL in 2019.
- Chairman of the organizing committee for the graduation ceremony of the Computer Science department of UCBL with more than 400 participants.
- Obtaining the CyberEdu label (launched by the ANSII French agency) for the Master 2 SRS of UCBL in 2020.

3 Teaching Duties

Courses responsibilities² are highlighted in grey

2020-2021 : Total amount of teaching : 256 hours

L3 (UCBL)	Networks	17h (tutorials)
M1 Info (UCBL)	Distributed Algorithms	18h (tutorials & practical works)
M1 Info ³ (UCBL)	Networking	27h (tutorials & practical works)
M2 CCI ⁴ (UCBL)	System Administration and Security	27h (lectures & practical works)
M2 CCI (UCBL)	Advanced Networks	33h (lectures, tutorials & practical works)
M2 SRIV ⁵ (UCBL)	Advanced Networks	36h (lectures, tutorials & practical works)
M2 SRIV (UCBL)	Advanced Systems	8h (lectures & practical works)
M2 TIW ⁶ & M2 DS ⁷ (UCBL)	Cloud Computing - Performance Evaluation	13h (lectures & practical works)
M1 Info (UCBL)	Project mentoring	15h
M2 SRIV (UCBL)	Interns mentoring	18h
M2 CCI (UCBL)	Interns mentoring	12h
M2 SRIV (UCBL)	Head of the Master 2 speciality SRIV	32h

2. co-responsible for courses of M2 CCI

3. Master 1 Informatique - <http://master-info.univ-lyon1.fr/M1>

4. Master 2 Compétences Complémentaires en Informatique - <http://master-info.univ-lyon1.fr/CCI>

5. Master 2 Systèmes, Réseaux et Infrastructures Virtuelles - <http://master-info.univ-lyon1.fr/SRIV>

6. Master 2 Technologies de l'Information et Web - <http://master-info.univ-lyon1.fr/TIW>

7. Master 2 Data Science - <http://master-info.univ-lyon1.fr/DS>

2019-2020 : Total amount of teaching : 230 hours

L3 (UCBL)	Networks	8h (tutorials)
M1 Info (UCBL)	Distributed Algorithms	18h (tutorials & practical works)
M1 Info (UCBL)	Networking	29h (lectures, tutorials & practical works)
M2 CCI (UCBL)	System Administration and Security	25h (lectures & practical works)
M2 CCI (UCBL)	Advanced Networks	38h (lectures, tutorials & practical works)
M2 SRIV (UCBL)	Advanced Networks	20h (lectures, tutorials & practical works)
M2 SRIV (UCBL)	Saving, Cloud and Virtualisation	7h (lectures & practical works)
M2 TIW & M2 DS (UCBL)	Cloud Computing - Performance Evaluation	9h (lectures & practical works)
M1 Info (UCBL)	Project mentoring	12h
M2 SRIV (UCBL)	Interns mentoring	18h
M2 CCI (UCBL)	Interns mentoring	12h
M2 SRIV (UCBL)	Head of the Master 2 speciality SRIV	32h

2018-2019 : Total amount of teaching : 223 hours

L3 (UCBL)	Networks	18.5h (tutorials)
M1 Info (UCBL)	Distributed Algorithms	18h (tutorials & practical works)
M1 Info (UCBL)	Networking	44h (lectures, tutorials & practical works)
M2 CCI (UCBL)	System Administration and Security	10.5h (lectures & practical works)
M2 CCI (UCBL)	Advanced Networks	38h (lectures, tutorials & practical works)
M2 SRIV (UCBL)	Advanced Networks	20h (lectures, tutorials & practical works)
M2 TIW & M2 DS (UCBL)	Cloud Computing - Performance Evaluation	9h (lectures & practical works)
M1 Info (UCBL)	Student mentoring	20h
M1 Info (UCBL)	Project mentoring	12h
M2 SRIV (UCBL)	Student mentoring	36h

2017-2018 : Total amount of teaching : 202 hours

L3 (UCBL)	Networks	20h (tutorials)
M1 Info (UCBL)	Distributed Algorithms	9h (tutorials)
M1 Info (UCBL)	Networking	44h (lectures, tutorials & practical works)
M2 CCI (UCBL)	Advanced Networks	43h (lectures, tutorials & practical works)
M2 SRIV (UCBL)	Advanced Networks	21h (lectures, tutorials & practical works)
M2 TIW & M2 DS (UCBL)	Cloud Computing - Performance Evaluation	10.5h (lectures & practical works)
M1 Info (UCBL)	Project mentoring	12h
M2 SRIV (UCBL)	Student mentoring	39h

2016-2017 : Total amount of teaching : 204 hours

L3 (UCBL)	Networks	22h (tutorials)
M1 Info (UCBL)	Distributed Algorithms	18h (tutorials & practical works)
M1 Info (UCBL)	Networking	47h (lectures, tutorials & practical works)
M2 CCI (UCBL)	Advanced Networks	39h (lectures, tutorials & practical works)
M2 SRIV (UCBL)	Advanced Networks	18h (lectures, tutorials & practical works)
M2 TIW & M2 DS (UCBL)	Cloud Computing - Performance Evaluation	7.5h (lectures & practical works)
M1 Info (UCBL)	Student mentoring	20h
M1 Info (UCBL)	Project mentoring	12h
M2 SRIV (UCBL)	Student mentoring	18h

2015-2016 : Research leave at University of Ottawa

2014-2015 : Total amount of teaching : 210 hours

L3 (UCBL)	Networks	18h (tutorials)
M1 Info (ENSL)	Networks and Performance Evaluation	18h (lectures)
M1 Info (UCBL)	Networking	63h (lectures, tutorials & practical works)
M2 Info (INSA)	Future networks	15h (lectures)
M2 SIR ⁸ (UCBL)	Network Architecture	16.5h (lectures, tutorials & practical works)
M2 SIR (UCBL)	Advanced Networks	36h (lectures, tutorials & practical works)
M1 Info (UCBL)	Project mentoring	21h
M2 SIR (UCBL)	Student mentoring	24h

8. Master 2 Systèmes Informatiques et Réseaux (remplacé par le M2 SRIV depuis 2016)

2013-2014 : Total amount of teaching : 196 hours

L3 (UCBL)	Networks	20.5h (tutorials)
M1 Info (UCBL)	Networking	60h (lectures, tutorials & practical works)
M2 Info (INSA)	Future networks	12h (lectures)
M2 SIR (UCBL)	Network Architecture	9h (lectures, tutorials & practical works)
M2 SIR (UCBL)	Advanced Networks	54h (lectures, tutorials & practical works)
M1 Info (UCBL)	Project mentoring	18h
M2 SIR (UCBL)	Student mentoring	23h

2012-2013 : Total amount of teaching : 219 hours

L3 (UCBL)	Networks	20.5h (tutorials)
M1 Info (ENSL)	Network Algorithms	6h (lectures)
M1 Info (UCBL)	Networking	54h (lectures, tutorials & practical works)
M2 Info (ENSL)	Performance Evaluation	22.5h (lectures)
M2 SIR (UCBL)	Network Architecture	18h (lectures, tutorials & practical works)
M2 SIR (UCBL)	Advanced Networks	61.5h (lectures, tutorials & practical works)
M1 Info (UCBL)	Project mentoring	12h
M2 SIR (UCBL)	Student mentoring	27h

2011-2012 : Total amount of teaching : 195 hours

L3 (UCBL)	Networks	20h (tutorials)
M1 Info (UCBL)	Networking	60h (lectures, tutorials & practical works)
M2 Info (ENSL)	Performance Evaluation	18h (lectures)
M2 SIR (UCBL)	Network Architecture	18h (lectures, tutorials & practical works)
M2 SIR (UCBL)	Advanced Networks	55.5h (lectures, tutorials & practical works)
M1 Info (UCBL)	Project mentoring	3h
M2 SIR (UCBL)	Student mentoring	18h
M2 CCI (UCBL)	Student mentoring	3h

2010-2011 : Total amount of teaching : 193 hours

L3 (UCBL)	Networks	20h (tutorials)
M1 Info (UCBL)	Networking	66h (lectures, tutorials & practical works)
M2 SIR (UCBL)	WAN and high-performance networks	63h (lectures, tutorials & practical works)
M1 Info (UCBL)	Project mentoring	18h
M2 SIR (UCBL)	Student mentoring	24h
M2 CCI (UCBL)	Student mentoring	3h

2009-2010 : Total amount of teaching : 150 hours

L3 (UCBL)	Networks	44h (tutorials & practical works)
M1 Info (UCBL)	Networking	60h (lectures, tutorials & practical works)
M2 CCI (UCBL)	Algorithm and Programming	3h (practical works)
M2 SIR (UCBL)	Client-Server Model, Network Administrator	22h (practical works)
M2 SIR (UCBL)	Internet Protocols	15h (practical works)
M2 TIW (UCBL)	Applicative Protocols for Internet	10h (practical works)
M1 Info (UCBL)	Project mentoring	12h

2005-2008 : Total amount of teaching : 260 hours

L1 (UVM ⁹)	Imperative Programming (C language)	32h (practical works)
L1 (UVM)	Experimental Algorithm	66h (tutorials & practical works)
L2 (UVM)	Computer Architecture	32h (practical works)
L3 (UVM)	Computational complexity theory	66h (tutorials & practical works)
L3 (UVM)	Operating Systems	64h (tutorials & practical works)

4 Research Responsibilities

- **Head of the research team HoWNet** of the LIP laboratory since its inception in September 2021. Previously, member of the research teams Dante (2013-2021) and Reso (2009-2013) of the LIP.
- Referent of ENS Lyon for PEPR (Programme et Équipements Prioritaires de Recherche) "5G and future technologies for telecommunication networks" in PIA4 (4ème Programme d'Investissements d'Avenir).
- **Elected member** of the **LIP laboratory council** since February 2010 (reelected in February 2016 and December 2020).

5 Research Activity

Areas of interest

My research activities are in the field of performance evaluation and modeling of computer systems and networks. Areas of interest include, but are not limited to, the following :

- Performance evaluation
- Analytical Models
- Queueing systems
- Resource allocation, sizing and management
- Wireless protocols

9. Université du Val de Marne

- Software-Defined Network and Network Function Virtualization
- Data centers and Cloud Computing
- Vehicular Networks

Some recent contributions

Computer networks have become part of our daily life in our modern societies. Over the past two decades, the number of Internet users has grown from 147 million to over 4 billion, and new applications have appeared (e.g., instant messaging, voice over IP, social networking, video on demand). To meet these new demands, networks have evolved considerably, increasing their performance and services and offering wireless access to their users. The rapid development of the IEEE 802.11 standard (marketed as Wi-Fi) since its inception in 1997 is a good example. More recently, the introduction of NFV (Network Function Virtualization) will enable more flexible and efficient management of networks by replacing specialized and proprietary hardware with software running on standard hardware. The constant renewal of network technologies and the growing need for quality of service make the modeling of network performance crucial.

Performance Evaluation of a virtual switch based on DPDK

With the development of NFV, network functions will gradually move from specialized and proprietary equipment to software executed on virtual machines deployed on standard hardware. This new paradigm also applies to the main network function, namely packet switching. Open vSwitch (OVS) is the best known open-source solution for implementing a virtual switch (vSwitch), i.e. software that relays packets between network interfaces. OVS is often accompanied by DPDK (Data Plane Development Kit) which is a specialized library allowing to speed up the processing of packets, in particular by processing them in batches.

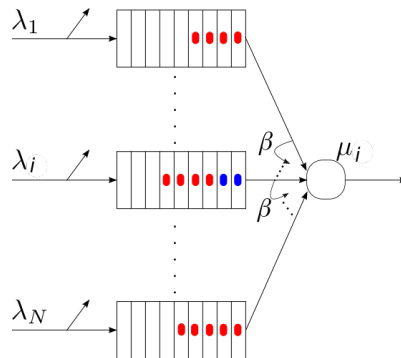


FIGURE 1 – Example of a subsystem with one CPU core processing N queues with batches of size $M=2$. Blue packets are currently processed while red packets are waiting for their turn.

As part of the ANR REFLEXION project, I participated in the design of an analytical queueing model to evaluate the performance of a DPDK-based vSwitch. We have represented it as a “polling” system in which the packets are distributed in separate queues and then processed in batches (cf. Figure 1).

In order to reduce the complexity of this model, we have developed a solution allowing to decouple the polling system into several subsystems, each corresponding to a CPU core. We then use queues in which the server takes vacations to represent the interactions between the subsystems. The model calculates performance metrics such as buffer occupancy, loss rate, and packet sojourn time in the vSwitch. The proposed solution is conceptually simple, inexpensive in terms of calculation and generally accurate. We compared its results to those produced on a real vSwitch as well as those of a simulator. Many real case studies illustrate how our model can help fine tune the parameters of a vSwitch. Thanks to this work, 6wind, cofounder of the DPDK library, was able to change its default configuration for the DPDK parameters.

Associated publications : 1 paper in a journal [J8] and 3 papers in international conferences [C12, C13, C14].

Characterizing IEEE 802.11-based networks through their conflict graph

Local wireless networks (WLANs) based on the IEEE 802.11 standard have become ubiquitous in our daily life. To extend their coverage and transmission capacity, network administrators typically increase the number of access points (APs) that make up the WLAN. This practice which leads to the densification of the network requires some form of coordination between the APs in order to avoid inefficient WLAN configurations.

As part of the ANR RESCUE project, I was first interested in the behavior of multi-hop networks. The main difficulty here comes from the very strong correlations in the behavior of the nodes, be it at the level of their sharing of the radio link or at the load levels. We have developed an original method allowing to discover the performance of a chain of nodes such as its maximum attainable throughput, its end-to-end delay and its loss rate [J15]. Despite good results, this approach was limited by its complexity to chains of 4 nodes. More recently, we have developed a method for modeling the performance of WLANs with the initial ambition to be able to handle larger-scale networks. The proposed approach estimates the throughput reached by each AP as a function of the WLAN conflict graph (see Figure 2), the load submitted to each AP, the size of the frames and the data rate of radio links. Our solution is based on a strategy of the type “Divide and conquer” which separates the initial problem into several sub-problems whose solutions are combined to obtain that of the initial problem [J11]. The model is generally accurate and can process networks comprising up to several tens of nodes. We have shown how its use can help a network administrator to better configure the networks, for example, by efficiently allocating frequency channels to APs when deploying a WLAN.

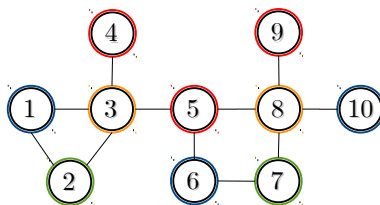


FIGURE 2 – Example of a conflict graph for a local wireless network with 10 nodes. Here, nodes 1 and 4 can transmit simultaneously without the risk of frame collision. On the other hand, if nodes 1 and 2 transmit simultaneously then their transmissions will likely collide.

Associated publications : 2 papers in journals [J11, J15] and 4 papers in international conferences [C11, C20, C21, C25].

Modeling complex systems using a reduced-state description

The $Ph/Ph/c$ and $Ph/Ph/c/N$ queues are common models for multi-server systems. The behavior of these systems is complex because it depends on multiple factors (customers arrival process, service time distribution, size of the buffer to store customers waiting to be served, number of servers). When the arrival process departs from a Poisson process, the service time distribution departs from an exponential distribution, and the number of servers is large, current solutions for calculating stationary probabilities no longer work due to the combinatorial explosion of the number of states inherent in the classical state description, also known as the dimensionality curse.

In this work, we have proposed an original approximation to calculate the stationary probabilities of these queues thanks to a reduced-state description which circumvents the combinatorial growth of the number of states [J16, J17]. The number of equations to be solved in this approach grows linearly with the number of servers and the number of phases in the distribution of service time. The accuracy of the approximation is generally very good and tends to improve for a large number of servers. We have extended this approach to other systems such as FIFO-type queues with different customers classes and priority levels [J9, J12] (cf. Figure 3).

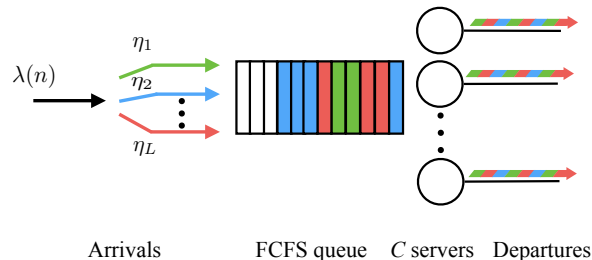


FIGURE 3 – A multiserver FIFO queue with multiple classes of customers. Each class has its own arrival rate and service time distribution. This model explains how different classes share together their resources.

Associated publications : 4 papers in journals [J9, J12, J16, J17].

Modeling the input-output behavior of a system

The complexity of certain systems or the ignorance of their internal functioning makes it impossible to develop a model by a constructive approach. Nevertheless, the need to obtain a predictive model may persist. This is why we have developed an original [J20] approach which allows us to discover a predictive model of performance by relying only on the external behavior of a system represented by a set of measures (cf. Figure 4). The model is chosen automatically while ensuring that it reproduces the qualitative behavior of the measurements. Its parameters are calibrated in order to reproduce as closely as possible the quantitative behavior indicated by the measurements. In some ways, this modeling approach is akin to a learning technique. We had the opportunity to test the correct functioning of this approach on numerous examples.

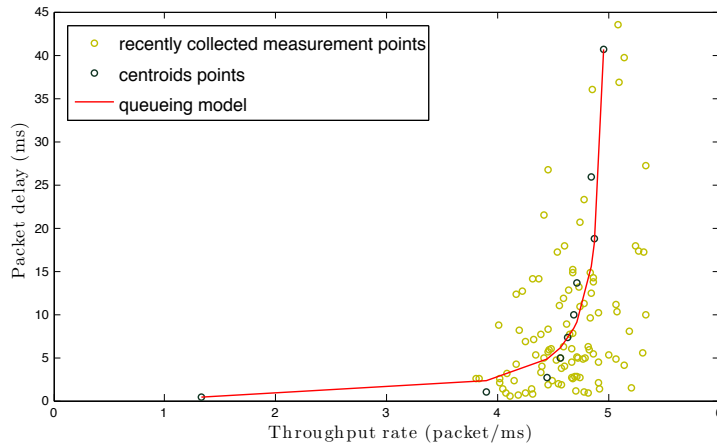


FIGURE 4 – Predicting model found using measurement points. Our tools enables to discover a calibrated $M/G/1$ queue with an offset delay on its sojourn time that reproduces the behavior of the system under study as characterized by its centroids (computed based on measurements). Using centroids enables us to circumvent the high dimensionality brought by the numerous measurement points.

We have also extended this modeling approach to deal with cases where new measurements are regularly received and the sought model should therefore be updated [C26]. More recently, we have studied the case of multi-component systems (cf. Figure 5). Assuming for example that we have a performance model for the response time of each component, we have shown how it is then possible to combine these models in order to obtain a predictive model for the response time of the overall system. [C16]. This type of approach could be useful to obtain a performance model for a software architecture involving many software components.

Associated publications : 2 papers in journals [J20, J21] and 4 papers in international conferences [C16, C26, C36, C37].

Other recent activities

More recently, I started a work on the distribution of video on demand (VoD) on vehicular networks [C10] [J6, J7] in collaboration with Pr. A. Boukerche (Univ. Ottawa). I also started to develop performance tools specially designed to be able to evaluate the performance of consolidation policies (by moving virtual machines) in data centers with Pr. A. Brandwajn (Univ. California, Santa Cruz) [J14].

Associated publications : 3 papers in journals [J6, J7, J14] and 1 paper in an international conference [C10].

6 Research Projects and Industrial Contracts

European project

— **SAIL** (FP7, 2009-2012).

Partners : 25 with Ericsson as leader.

For more information : <http://www.sail-project.eu/>

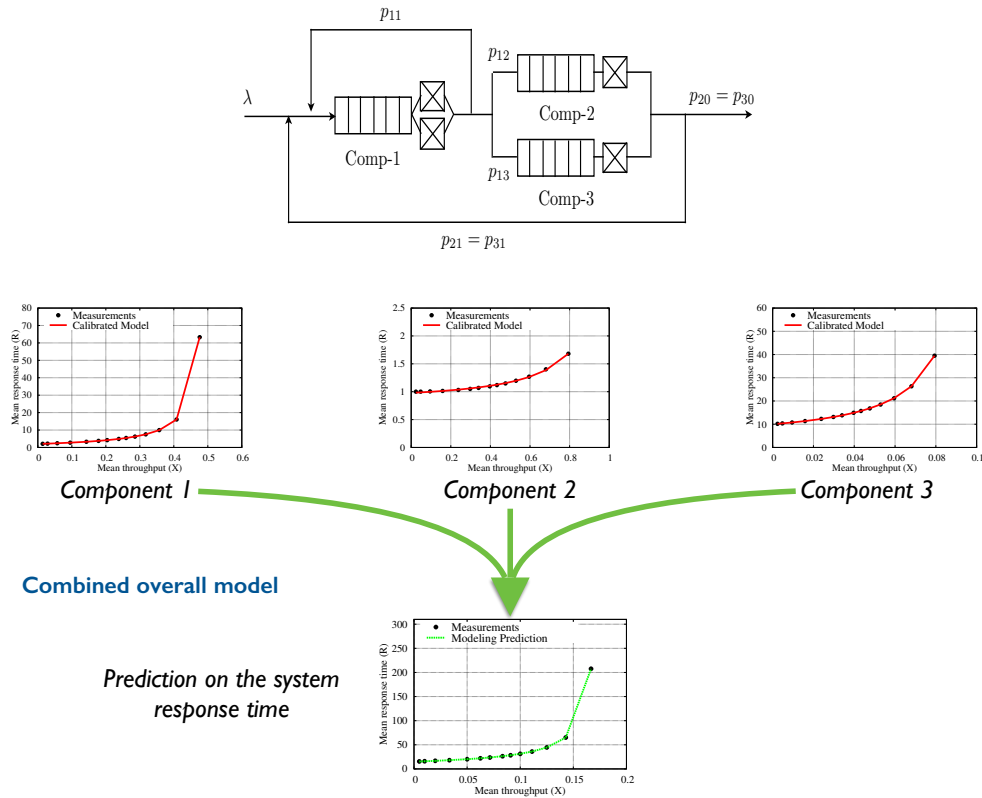


FIGURE 5 – Predicting the performance of a 3-component system by combining models of its components. Knowing the architecture of the system and the behavior of its components enables the performance of the overall system to be accurately predicted.

Goals : Demonstrating the potential brought by the networking virtualization and by the dynamic allocation of resources.

Overall budget : 12.7 M€

Main results : A Ph.D. degree (2014) and several publications.

National projects

- **FACTO** (ANR Generic Call, 2021-2024).
Partners : CNRS, LIP, Orange, Fondation Blaise Pascal.
For more information : <https://facto.irisa.fr/>
Goals : Replacing the multiple communication technologies used for the smart home devices with only Wi-Fi.
Overall budget : 566 K€ dont 207 K€ pour le LIP.
Role : Site leader for LIP, of one WP and of one deliverable.
- **CONCERTO** (ANR Astrid Call, 2021-2022, <https://anr.fr/Projet-ANR-20-ASTR-0003>).
Partners : INSA Lyon, LIP, CNRS, Univ de Lorraine, Alerion.
Goals : Controlled mobility and efficient communications for a self-organizing fleet of drones.
Overall budget : 300 K€ dont 69 K€ pour le LIP.

- **GreenHMR** (CNRS INS2I emerging project, 2020-2021).
Partners : LIP, IRISA.
Goals : Reducing energy consumption in heterogeneous networks.
Overall budget : 14 K€.

- **REFLEXION** (ANR Generic Call, 2015-2017, <https://anr.fr/Projet-ANR-14-CE28-0019>).
Partners : Thalès, LIP, Orange, Inria Sophia, LIP6, 6wind, TPT.
For more information : <http://anr-reflexion.telecom-paristech.fr/>
Goals : Designing efficient and dynamic allocation of the switches resources (CPUs and RAM) based on the actual networking activities.
Overall budget : 800 K€ dont 85 K€ pour le LIP.
Role : Site leader for ENS Lyon, of one WP and of one deliverable.
Main results : Several publications.

- **DISCO** (ANR Appel Infra, 2014-2016, <https://anr.fr/Projet-ANR-13-INFR-0013>).
Partners : Thalès, LIP, Inria Sophia et 6wind.
For more information : <http://anr-disco.ens-lyon.fr/>
Goals : Developing measurement and analytics algorithms to enhance the resource utilization of SDN networks.
Overall budget : 790 K€ dont 105 K€ pour le LIP.
Role : Site leader for ENS Lyon, of one WP and of one deliverable.
Main results : A Ph.D. degree (2017) and several publications.

- **GRAPHSIP** (ANR Generic Call, 2015-2018, <https://anr.fr/Projet-ANR-14-CE27-0001>).
Partners : Univ. Caen, LIP, UPEM, Institut Polytechnique de Grenoble.
For more information : <https://graphsip.greyc.fr/>
Goals : Developing a set of advanced methods and algorithms for the processing of graph signals.
Overall budget : 500 K€

Main results : A Master internship (2018) and a publication (conference. [N6]).

- **RESCUE** (ANR Appel Verso, 2010-2013, <https://anr.fr/Projet-ANR-10-VERS-0003>).
Partners : Inria Lille, LIP, LAAS, UPMC et Orange.
Goals : Modeling the performance of a wireless substitution network.
Overall budget : 744 K€ dont 119 K€ pour le LIP.

Main results : A Ph.D. degree (2014) and several publications.

Industrial contracts

- **Startup Stackeo** (<https://www.stackeo.io/>) (2020-).
Context : In the IoT, it is often a complex matter to choose the appropriate network protocol with regards to the specif constraints, needs and usage of an application.
Goals : Developing efficient simulation methods for the network protocols of the IoT.
Overall budget : 120 K€
Main results : An ongoing Ph.D. degree (2020), a publication ([C4]).
Role : co-scientific leader for ENS Lyon for this project.

- **Alcatel Lucent Bell Labs joint research lab** (2009-2012).
Context : Contributing to the Semantic Networks Task between 2008 and 2012.
Goals : Discovering necessary information to be included in a Knowledge plane for an efficient Admission Control.
Overall budget : 820 K€
Main results : A Ph.D. degree (2012), several publications, and a Demo at the Open Days of Alcatel Lucent in May 2012.
Role : participant to the research action “Semantic Networking”.

Local projects

- **Winter** (FIL (Fédération Informatique de Lyon) project, 2021-2022, <https://fil.cnrs.fr/les-projets-2021-2022/>).
Partner : Privatics Research Team from CITI Lab (INSA Lyon)
Goals : Evaluating the feasibility of using random MAC addresses in WLAN networks to strengthen the privacy of end users.
Overall budget : 7 K€.
Role : co-scientific leader with M. Cunche.
- **Alienor** (FIL (Fédération Informatique de Lyon) project, 2019-2020, <https://fil.cnrs.fr/les-projets-2019-2020/>).
Partner : Agora Research Team from CITI Lab (INSA Lyon)
Goals : Using machine learning techniques to improve the rate adaptation mechanism used by 802.11-based networks.
Overall budget : 5 K€.
Role : co-scientific leader with R. Stanica.
- **ENS Lyon project**, 2017-2019.
Partner : network Research Team from UPC (Polytechnic University of Catalonia)
Goals : Improving the sharing of resources in vehicular networks.
Overall budget : 16 K€.
Main results : A publication in a conference.
Role : scientific leader for this project.
- **MISSION** (ARC (Action Recherche Coopérative), Inria, 2010-2011).
Partners : Inria Lille et LIP6.
Goals : Characterizing the performance of a wireless substitution network.
Overall budget : 84 K€.

Main results : One publication.
- **Interdisciplinary project at LIP6**, 2006-2007.
Partner : the Operational Research Team from LIP6.
Goals : Designing an efficient optimization method for calibrating queueing models.
Overall budget : 10 K€.
Main results : One publication in a journal.
Role : co-scientific leader.

7 International Collaborations and Mobility

I have close long-standing collaborations with :

- **University of California, Santa Cruz (UCSC, USA)**. I work closely with Pr. A. BRANDWAJN. Between 2009 and 2018, I visit his team for 2-4 weeks each year. Pr. A. BRANDWAJN was four times invited by Milyon Labex, ENS Lyon and Inria, spending almost 11 months in Lyon between 2010 and 2018. We design methods to solve queueing systems.
- **Polytechnic University of Catalonia (UPC, Spain)**. I work with Ass. Pr. M. AGUILAR and Ass. Pr. Luis J. de la CRUZ LLOPIS. In June 2017, I visited their team for 1 week. We study vehicular networks and the performance of IoT. In 2018 and 2019, two of their students jointed our team for a summer internship.
- **Université Pierre et Marie Curie (UPMC, France)** and its LIP6 lab to which belongs Ass. Pr. B. BAYNAT with whom I developed a performance modeling framework for a NFV appliance.
- **Capital University of Science & Technology (CUST, Pakistan)** and **National University of Sciences & Technology (NUST, Pakistan)** with whom I work on energy consumption in the wireless networks. I stayed a week in Islamabad in 2017.
- **University of Ottawa (Canada)**. I collaborate closely with the laboratory headed by Pr. A. BOUKERCHE to evaluate the behavior of communications in vehicular networks. I spent a full year there in 2015-2016 (research leave) and a week in 2018.
- **University of Hamburg (Germany)**. Together with the team of Pr. B. WOLFINGER, we extended our automatic modeling method to handle new types of measurements with additional information.
- **Télécom Sud Paris (TSP, France)** with Pr. H. CASTEL-TALEB and Pr. T. ATMACA with whom I study the performance modeling of cloud computing.

I was the recipient of a mobility grant delivered by Inria for the academic year 2015-2016.

8 Supervision

Former Ph.D. students (5)

- **Doreid AMMAR**, "*Knowledge plane for semantic networking*", co-directed with I. Guérin Lassous (2009-2012). Follow-up position : PostDoc at VTT (Finland) . Current position : Associate Professor at EM Lyon Business School (France).
- **Roy SHUBHABRATA**, "*A Complete Framework for Modelling Workload Volatility of a VoD System : a Perspective to Probabilistic Management*", co-directed with P. Gonçalves (2010-2014). Follow-up position : Research engineer at RealEyes (Hungary).
- **Thiago ABREU**, "*Modeling and performance analysis of IEEE 802.11-based chain networks*", co-directed with I. Guérin Lassous (2011-2014). Follow-up position : PostDoc at LIP6 (France) . Current position : Associate Professor at Univ. Paris Est (France).
- **Huu Nghi NGUYEN**, "*Estimating the end-to-end delay through passive methods*", co-directed with I. Guérin Lassous and A. Busson (2014-2017). Follow-up position : Research engineer at SCOR (France).

- **Marija STOJANOVA**, ”*Adaptative solutions for multi-hop wireless networks*”, (2016-2019), fully directed (100%). Follow-up position : ATER at UCB Lyon 1 (France).

Current Ph.D. student (3)

- **Anthony BARDOU**, ”*Reinforcement learning for the configuration of Wi-Fi 6*”, (2020-), fully directed (100%).
- **Samir SI-MOHAMED**, ”*Optimizing networks of Internet of Things*”, (2020-), co-directed (50%) with I. Guérin Lassous.
- **Esther GUÉRIN**, ”*Making the Wi-Fi able to support all wireless communications in the smart home*”, (2021-), co-directed (50%) with I. Guérin Lassous.

Former Postdoc student

- **Guillaume ARTERO GALLARDO**, ”*Performance modeling of virtual switching systems*”, co-supervised with B. Baynat (2015-2016). Follow-up position : Research engineer at Sysoco (France).

Former M.Sc. students (17)

- **Rémi DRUILHE**, ”*Communications in parallel applications : the Hadoop study case*”, co-directed with O. Glück and I. Guérin Lassous (Feb - Jun 2010). Follow-up position : Ph.D. student at Orange Labs.
- **Aurélien LAFRANCHISE**, ”*Multiclass routing. Differentiated routing for real-time and elastic traffic*”, co-directed with I. Guérin Lassous (Feb - Jun 2010). Follow-up position : Engineer at Snype Consulting.
- **The Quang BUI**, ”*Failover wireless network in the crisis context*”, co-directed with P. Gonçalves (Apr - Nov 2010). Follow-up position : Ph.D. student at Université Clermont-Ferrand II.
- **Van Dan NGUYEN**, ”*Multi-constrained routing : a first step toward a more realistic evaluation*”, co-directed with I. Guérin Lassous (Apr - Nov 2010). Follow-up position : Research engineer in Mascotte team (Inria).
- **Nghi NGUYEN**, ”*Investigating the numerical behavior of matrix geometric methods for solving queueing systems*”, (Apr - Sep 2011), encadré seul (100%). Follow-up position : Research engineer in RESO team (Inria).
- **Omar DAHMANI**, ”*Experiments in multi-hop wireless networks*”, co-directed with I. Guérin Lassous (Feb - Jun 2015). Follow-up position : Systres Consulting.
- **Zidong SU**, ”*Performance Evaluation of Virtual Switch By Polling System*”, co-directed with B. Baynat (Feb - Jun 2016). Follow-up position : Research engineer in Dante team (Inria).
- **Marija STOJANOVA**, ”*Studying the performance of the VANETs networks*”, co-directed with A. Busson (Feb - Jun 2016). Follow-up position : preparing a Ph.D. under my supervision.

- **Simon FERNANDEZ**, ”*Reducing the energetic consumption in mobile heterogeneous networks*”, co-directed with I. Guérin Lassous (Feb - Jun 2019). Follow-up position : Internship at LIG.
- **Anthony BARDOU**, ”*Machine Learning for the spatial reuse of Wi-Fi networks.*”, co-directed with A. Busson (Apr - Aug 2020). Follow-up position : preparing a Ph.D. under my supervision.
- **Ziyi LIU**, ”*Using Artificial Intelligence to better configure WLANs*”, co-directed with R. Stanica (Feb - Jun 2020).
- **Mehdi GEAD**, ”*Combining efficiently Wi-Fi and Li-Fi networks*”, co-directed with I. Guérin Lassous (Mars - Jul 2020).
- **Esther GUÉRIN**, ”*Optimizing throughput and energy in heterogeneous networks*”, co-directed with A. Busson and I. Guérin Lassous (Sep 2020 - July 2021).
- **Amel CHADDA**, ”*Assigning channels in WLANs with channel bonding*”, co-directed with A. Busson and I. Guérin Lassous (Sep 2020 - July 2021).
- **Fatima CHAHAL**, ”*Virtual WLAN interface rotation for privacy protection - Theoretical aspects*”, co-directed with M. Cunche (May 2021 - Oct 2021).
- **Johann HUGON**, ”*Virtual WLAN interface rotation for privacy protection - Practical aspects*”, co-directed with M. Cunche (Sep 2021 - July 2022).
- **Meriem GHALI**, ”*Optimizing heterogeneous networks based on Wi-Fi & Li-Fi*”, co-directed with A. Busson and I. Guérin Lassous (Sep 2021 - July 2022).

Current M.Sc. students

- **Tom OGIER**, ”*Implementing and Evaluating Energy-Saving Mechanisms in Wi-Fi*”, co-directed with I. Guérin Lassous (Sep 2022 - July 2023).

9 Dissemination, Awards, and Collective Responsibilities

Distinctions

- I received the **ACM MSWiM'20 Rising Star Award**. http://mswimconf.com/2020/risingstar_award.html
- Our paper [N1] received the best paper award at the Algotel 2022 conference.
- I am a recipient of the Scientific Excellence Award (Prime d'Excellence Scientifique) since 2012.
- Selected papers for fast track journal publication
 - . ACM MSWiM 2018 [C10] → Elsevier Computer Communications Journal
 - . ACM PE-WASUN 2019 [C9] → Elsevier Ad Hoc Networks Journal
 - . ACM PE-WASUN 2020 [C8] → Elsevier Computer Networks Journal
 - . ACM MSWiM 2021 [C6] → Elsevier Computer Communications Journal

Program Committees

I was co-chair of Program Committee for the following conference

- **Algotel 2019** (Conférence Francophone sur les aspects Algorithmiques appliquée aux problèmes des Télécommunications).
Algotel is the leading French conference for the research community on algorithmic and optimization applied to communication networks. For more information : <https://www.irit.fr/algotel2019/>
- **ACM PE-WASUN 2021** (International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks).
For more information : <http://pewasun.upc.edu/PEWASUN2021/>
- **ACM PE-WASUN 2022** (International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks).
For more information : <http://pewasun.upc.edu/PEWASUN2022/>

I was a member of Program Committee for the following conferences

- **IEEE LCN 2021, 2020, 2019, 2018, 2017, 2016, 2015** (IEEE Local Computer Networks Conference).
- **IEEE ICCCN 2020** (International Conference on Computer Communications and Networks).
- **IEEE ICDCS 2022** (International Conference on Distributed Computing Systems).
- **IEEE ISCC 2022** (International Symposium on Computers and Communications).
- **ACM MSWiM 2017** (ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems).
- **ACM PE-WASUN 2020, 2015, 2014, 2013, 2012** (ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks).
- **IEEE CIF 2014** (IEEE International Workshop on Complex Information Flows).
- **Algotel 2021** (Conférence Francophone sur les aspects Algorithmiques appliquée aux problèmes des Télécommunications).
- **NOTERE / CFIP 2012** (Nouvelles Technologies de la Répartition / Colloque Francophone sur l'Ingénierie des Protocoles).

I was co-guest editor for :

- A Special Issue of Ad Hoc Networks published by Elsevier in 2022. For more information : <https://tobeannounced/>

I was co-organiser of the following scientific event :

- **Journées Cloud 2020** (Soutenue par l'action Virtualisation et Cloud du GdR RSD (Réseaux et Systèmes Distribués) du CNRS).
The Journées Cloud event gathers French academics and industrials working in the area of virtualization and cloud. The 2020 edition achieved the participation of more than 90 participants. For more information : <https://journescloud20.sciencesconf.org/>

Refereeing Activity

I have refereed articles submitted to :

- **IEEE TNSM** - Transactions on Network and Service Management
- **Elsevier PEVA** - Performance Evaluation
- **Elsevier COR** - Computers & Operations Research
- **Elsevier JPDC** - Journal of Parallel and Distributed Computing
- **IEEE TMC** - Transactions on Mobile Computing
- **Elsevier AMM** - Applied Mathematical Modeling
- **Informa OR** - Operations Research
- **RAIRO** - Operations Research
- **IEEE CL** - Communications Letters
- **Elsevier IoT** - Internet of Things

Participation to Juries of Ph.D. Thesis

I have been reviewer for the following Ph.D. Thesis :

- **Amira KAMLI**, “*Analysis and Optimisation of a new futuristic optical network architecture*”, delivered by Institut Polytechnique de Paris, France, November 2019.
- **Juan Pablo ASTILLO LEÒN**, “*Contribution to the Traffic Engineering in Wireless Mesh Networks*”, delivered by UPC (Polytechnic University of Catalonia), Spain, April 2020.

I have been a member of the juries of the following Ph.D. Thesis :

- **Syed Zubair AHMAD**, “*QoS Optimization through Capacity Aggregation of multiple links in Heterogeneous Wireless Networks*”, delivered by Faculty of Engineering and Applied Sciences, Mohammad Ali Jinnah University, Islamabad, Pakistan, February 2011.
- **Ahmed HERBAOUI**, “*Towards automatic modeling and provisioning for distributed applications*”, delivered by the Université de Grenoble, Grenoble, France, October 2011
- **El Hachemi BENDAHMANE**, “*Introduction Of Self-Optimization Features in a Self-benchmarking Architecture*”, delivered by the Université de Grenoble, Grenoble, France, September 2012.
- **Youssef Ait El Mahjoub**, “*Performance Evaluation of energy-efficient networks*”, delivered by UVSQ/Télécom Sud Paris, France, expected for January 2021.

Participation to Recruitment Committees

I have been a member of the recruitment committee for the following position :

- Assistant Professor at the Université Claude Bernard Lyon 1, Composante Informatique, Laboratory LIP, May 2013.
- Assistant Professor at the Université de Nice, Composante Informatique, Laboratory I3S, May 2015.
- Assistant Professor at the Université Claude Bernard Lyon 1, Composante Informatique, Laboratory LIP, May 2017.

- Assistant Professor at the Université Claude Bernard Lyon 1, Composante Informatique, Laboratory LIP, May 2019.
- Assistant Professor at the Université Claude Bernard Lyon 1, Composante Informatique, Laboratory LIP, May 2020.

Softwares development

- Responsible (design, development and deployment) of an innovative pedagogical tool on a website for solving classical queueing models. This work leveraged on recent research results and make them available to teachers and students from anywhere alike. Nearly 15 new visitors per day and more than 15,000 visits since its inception).
For more information : <http://queueing-systems.ens-lyon.fr>
- A demo during the “Open Days” of Alcatel Lucent in May 2012, for publicizing our work on admission control selected by a program committee.
- Contributor to the development of the SIFRAN software that delivers estimates of the key performance parameters for an IoT application
For more information : <https://sifran.labs.stackeo.io>

Session Chair

- **IEEE ASMTA in 2011** (International Conference on Analytical and Stochastic Modelling Techniques and Applications).
- **IEEE MSWiM in 2016, 2018, 2021** (ACM International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems).
- **PE-WASUN in 2016, 2021, 2022** (ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks).

Popularization

- Interview given to the OUR(S) journal (in French) following the fire at OVHcloud in 2021.

Miscellaneous

- Technical expert for ANR on program INFRA 2013.
- Technical expert for Associate Teams of Inria in 2020.
- Technical expert for a joint PhD program between a french university and industry.
- Member of the Organizing Committee for **GRETSI 2015** (main francophone Conference on Image and Signal Processing). <http://gretsi.fr/colloque2015/>
- Co-chair for tutorials scheduled during the conference **ACM MSWiM 2016**.
- Coordinator for the **working groups** of Inria RESO team from 2009 to 2013.
- Member of the staff committee for the laboratory LIP since 2019.
- Member of the LIP computer device commission since February 2018.
- Member of the monitoring committee for the PhD thesis of Clément Courageux-Sudan prepared at ENS Rennes in 2021.

Talks¹⁰

- “*A Study of Live VM Migration for Server Consolidation in Data Centers*” at CITI Lab, (INSA Lyon), Lyon, France, June 2022.
- “*LiFi/Wi-Fi based heterogenous WLANs : Discovering the best associations between stations and access points*” Invited talk at Workshop on Optical Wireless Communications : Status and Perspectives (part of the 10th edition of Photoptics), Online streaming, February 2022.
- “*Data center disaggregation - when and how much ?*” at CITI Lab, (INSA Lyon), Lyon, France, October 2021.
- “*Contributions to the Performance Modeling of Computer Networks*” at Huawei R&D Datacom Technical Seminar, July 2021.
- “*Contributions to the Performance Modeling of Computer Networks*” at CITI Lab (INSA Lyon) (INSA Lyon), Lyon, France, April 2019.
- “*A brief tour of Machine Learning techniques*” at LIP Lab (ENS Lyon) (ENS Lyon), Lyon, France, December 2018.
- “*A modeling framework for the performance evaluation of DPDK-based virtual switches*” at Diva Lab (university Ottawa) (University of Ottawa), Ottawa, Canada, June 2018.
- “*Modeling WiFi in a multihop wireless network : feedback on experience*” at CITI Lab (INSA Lyon), Lyon, France, April 2018.
- “*Performance Modeling of Virtual Switching Systems*” at Napital University of Science and Technology (CUST) and Capital University of Science and Technology (CUST), Islamabad, Pakistan, August 2017.
- “*Performance Modeling of Virtual Switching Systems*” at the Workshop Reflexion, GdR RSD - Journées Cloud 2016, Nice, France, September 2016.
- “*High-Level Modeling of the Communications between RSUs and vehicles - A preliminary study*” at the 5th NSERC DIVA workshop, Ottawa, Canada, February 2016.
- “*Modeling the Performance of an IEEE 802.11 path*” at Diva Lab (University of Ottawa), Ottawa, Canada, October 2015.
- “*An Admission Control based on a time-varying Queueing Model*” at IXXI (Institute for Complex Systems), Lyon, France, January 2013.
- “*A new approach to automatically get calibrated models based on performance measurements*” at LIP laboratory, Lyon, France, February 2011.
- “*New results for the Numerical Solutions of some classical Queueing Models*” at IFI (French Institute for the Computer Science), Hanoi, Vietnam, October 2010.

10. Talks for presenting accepted papers at conferences & workshops are not listed here.

10 Publications

The ranking of journals and conferences is based on CORE ERA Ranking¹¹. and on SCImago Journal Rank (SJR)¹² at the time of the paper submission.

International Journals (22)

- [J1] A. Bardou, T. Begin, and A. Busson. *Analysis of a Multi-Armed Bandit solution to improve the spatial reuse of next-generation WLANs*. *Computer Communications*, 193 :279–292, 2022. (Rank C, Q1).
- [J2] A. Bardou, T. Begin, and A. Busson. *Mitigating Starvation in Dense WLANs : A Multi-Armed Bandit Solution*. *Ad Hoc Networks*, pages 1–33, 2022. (Q1).
- [J3] A. Chadda, M. Stojanova, T. Begin, A. Busson, and I. Guérin Lassous. *Assigning Channels in WLANs with Channel Bonding : A Fair and Robust Strategy*. *Computer Networks*, 196 :1–8, 2021. (Rank A, Q1).
- [J4] M. Stojanova, T. Begin, and A. Busson. *A Markov Model for Performance Evaluation of Channel Bonding in IEEE 802.11*. *Ad Hoc Networks*, 115 :1–13, 2021. (Q1).
- [J5] J. P. Astudillo León, T. Begin, A. Busson, and L. de la Cruz Llopis. *A Fair and Distributed Congestion Control Mechanism for Smart Grid Neighborhood Area Networks*. *Ad Hoc Networks*, 104 :1–21, 2020. (Q1).
- [J6] T. Begin, A. Busson, I. Guérin Lassous, and A. Boukerche. *Delivering Video-on-Demand services with IEEE 802.11p to major non-urban roads : a stochastic performance analysis*. *Computer Networks*, 182 :1–12, 2020. (Rank A, Q1).
- [J7] T. Begin, A. Busson, I. Guérin Lassous, and A. Boukerche. *Performance Analysis of Video on Demand in an IEEE 802.11p-based Vehicular Network*. *Computer Communications*, 146 :174–185, 2019. (Rank C, Q1).
- [J8] T. Begin, B. Baynat, G. Artero Gallardo, and V. Jardin. *An accurate and efficient modeling framework for the performance evaluation of DPDK-based virtual switches*. *IEEE Transactions on Network and Service Management*, 4 :1407–1421, 2018. (Q1).
- [J9] A. Brandwajn and T. Begin. *First-Come-First-Served Queues with Multiple Servers and Customer Classes*. *Performance Evaluation*, 130 :51–63, 2018. (Rank A, Q2).
- [J10] A. Brandwajn, T. Begin, H. Castel-Taleb, and T. Atmaca. *A study of systems with multiple operating levels, probabilistic thresholds and hysteresis*. *IEEE Transactions on Parallel and Distributed Systems*, 29(4) :748–757, 2018. (Rank A*, Q1).
- [J11] M. Stojanova, T. Begin, and A. Busson. *Conflict graph-based model for IEEE 802.11 networks : A Divide-and-Conquer approach*. *Performance Evaluation*, 130 :64–85, 2018. (Rank A, Q2).
- [J12] A. Brandwajn and T. Begin. *Multi-server preemptive priority queue with general arrivals and service times*. *Performance Evaluation*, 115 :150–164, 2017. (Rank A, Q2).
- [J13] H. Soleimani, T. Begin, and A. Boukerche. *Safety message generation rate adaptation in LTE-based vehicular networks*. *Computer Networks*, 128 :186–196, 2017. (Rank A, Q1).
- [J14] T. Atmaca, T. Begin, A. Brandwajn, and H. Castel-Taleb. *Performance evaluation of cloud computing centers with general arrivals and service*. *IEEE Transactions on Parallel and Distributed Systems*, 27(8) :2341–2348, 2016. (Rank A*, Q1).

11. <http://www.core.edu.au>

12. <https://www.scimagojr.com>

- [J15] T. Begin, B. Baynat, I. Guérin Lassous, and T. Abreu. *Performance analysis of multi-hop flows in IEEE 802.11 networks : A flexible and accurate modeling framework*. *Performance Evaluation*, 96 :12–32, 2016. (Rank A, Q2).
- [J16] A. Brandwajn and T. Begin. *Breaking the dimensionality curse in multi-server queues*. *Computers & Operations Research*, 78 :141–149, 2016. (Rank A, Q1).
- [J17] A. Brandwajn and T. Begin. *Reduced complexity in M/Ph/c/N queues*. *Performance Evaluation*, 78 :42–54, 2014. (Rank A, Q2).
- [J18] A. Brandwajn and T. Begin. *A recurrent solution of Ph/M/c/N-like and Ph/M/c-like queues*. *Journal of Applied Probability*, 49(1) :84–99, 2012. (Q2).
- [J19] P. Gonçalves, S. Roy, T. Begin, and P. Loiseau. *Dynamic resource management in clouds : A probabilistic approach*. *IEICE Transactions on Communications, special session on Networking Technologies for Cloud Services*, 95(8) :2522–2529, 2012. Invited paper (Q3).
- [J20] T. Begin, A. Brandwajn, B. Baynat, B. Wolfinger, and S. Fdida. *High-level approach to modeling of observed system behavior*. *Performance Evaluation*, 67(5) :386–405, 2010. (Rank A, Q2).
- [J21] T. Begin, B. Baynat, A. Brandwajn, and F. Sourd. *A DFO technique to calibrate queueing models*. *Computers & Operations Research*, 37(2) :273–281, 2009. (Rank A, Q1).
- [J22] T. Begin and A. Brandwajn. *Higher-order distributional properties in closed queueing networks*. *Performance Evaluation*, 66(11) :607–620, 2009. (Rank A, Q2).

Articles in Proceedings of International Conferences with Program Committee (37)

- [C1] A. Bardou and T. Begin. *INSPIRE : Distributed Bayesian Optimization for Improving Spatial Reuse in Dense WLANs*. In *Proceedings of the 25th International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems, ACM MSWiM'22*, pages 1–10. Montréal, Canada, 2022. (Rank A).
- [C2] T. Begin, A. Brandwajn, and A. Tchana. *Data center disaggregation - when and how much ?* In *Proceedings of the 9th International Conference on Future Internet of Things and Cloud, IEEE FiCloud'22*, pages 1–5. Rome, Italy, 2022.
- [C3] A. Brandwajn, T. Begin, H. Castel-Taleb, and T. Atmaca. *A study of live vm migration for server consolidation in data centers*. In *Proceedings of the 9th International Conference on Future Internet of Things and Cloud, IEEE FiCloud'22*, pages 1–8. Rome, Italy, 2022.
- [C4] S. Si-Mohammed, T. Begin, I. Guérin Lassous, and P. Vicat-Blanc. *Introducing ADIperf, a Framework for Application-driven IoT Network Performance Evaluation*. In *Proceedings of the 31st International Conference on Computer Communications and Networks, IEEE ICCCN'22*, pages 1–8. Virtual Conference, 2022. (Rank B).
- [C5] S. Si-Mohammed, T. Begin, I. Guérin Lassous, and P. Vicat-Blanc. *SIFRAN : Evaluating IoT Networks with a No-Code Framework based on ns-3*. In *Proceedings of the 3rd Latin America Networking Conference, ACM LANCC'22*, pages 1–8. Armenia, Colombia, 2022.
- [C6] A. Bardou, T. Begin, and A. Busson. *Improving the Spatial Reuse in IEEE 802.11ax WLANs : A Multi-Armed Bandit Approach*. In *Proceedings of the 24th International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems, ACM MSWiM'18*, pages 135–144. Alicante, Spain, 2021. (Rank A).

- [C7] E. Guérin, T. Begin, A. Busson, and I. Guérin Lassous. *Towards a throughput and energy efficient association strategy for Wi-Fi/LiFi heterogeneous networks*. In *Proceedings of the 18th ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks, ACM PE-WASUN'20*, pages 119–126. Alicante, Spain, 2021.
- [C8] A. Chadda, M. Stojanova, T. Begin, A. Busson, and I. Guérin Lassous. *Towards a fast and efficient strategy to assign channels in WLANs with channel bonding*. In *Proceedings of the 17th ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks, ACM PE-WASUN'20*, pages 93–100. Valencia, Spain, 2020.
- [C9] J. P. Astudillo León, T. Begin, A. Busson, and L. de la Cruz Llopis. *Towards a distributed congestion control mechanism for smart grid neighborhood area networks*. In *Proceedings of the 16th ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks, ACM PE-WASUN'19*, pages 29–36. Miami, USA, 2019.
- [C10] T. Begin, A. Busson, I. Guérin Lassous, and A. Boukerche. *Video on Demand in IEEE 802.11p-based Vehicular Networks : Analysis and Dimensioning*. In *Proceedings of the 21st International Conference on Modeling, Analysis and Simulation of Wireless and Mobile Systems, ACM MSWiM'18*, pages 303–310. Montréal, Canada, 2018. (Rank A).
- [C11] M. Stojanova, T. Begin, and A. Busson. *Conflict graph-based markovian model to estimate throughput in unsaturated ieee 802.11 networks*. In *Proceedings of the 15th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, IEEE/IFIP WiOpt'17*, pages 1–8. Paris, France, 2017. (Rank B).
- [C12] Z. Su, B. Baynat, and T. Begin. *A new model for dpdk-based virtual switches (short paper)*. In *Proceedings of the 3rd Conference on Network Softwarization, IEEE NETSOFT'17*, pages 1–5. Bologna, Italy, 2017.
- [C13] Z. Su, T. Begin, and B. Baynat. *Towards including batch services in models for dpdk-based virtual switches*. In *Proceedings of the 9th Conference on Global Information Infrastructure and Networking Symposium, IEEE GIIS'18*, pages 37–44. Saint Pierre, France, 2017. (Rank C).
- [C14] G. Artero Gallardo, B. Baynat, and T. Begin. *Performance modeling of virtual switching systems*. In *Proceedings of the 24th IEEE International Symposium on Modelling, Analysis and Simulation of Computer and Telecommunication Systems, MASCOTS'16*, pages 125–134. London, England, 2016. (Rank A).
- [C15] T. Begin and A. Boukerche. *A note on the causes degrading communication between RSUs and vehicles in overloaded conditions*. In *Proceedings of the 13th ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks, ACM PE-WASUN'16*, pages 27–31. Valletta, Malta, 2016. Invited paper.
- [C16] T. Begin and A. Brandwajn. *Predicting the system performance by combining calibrated performance models of its components - a preliminary study*. In *Proceedings of the 7th ACM/SPEC International Conference on Performance Engineering, ICPE'16*, pages 95–100. Delft, Netherlands, 2016.
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11 Foreign Languages

French : Native
English : Fluent
German : Basic