

Cognome: **ELIAS**
Nome: **Jocelyne**
Data di nascita: 09/01/1978



CURRENT POSITION

- ❑ November 15, 2019 – now: Senior assistant professor (**Ricercatore a Tempo Determinato, RTDB**) at the Dipartimento di Informatica - Scienza e Ingegneria (DISI), Università di Bologna.
(*Maternity leave: from 1/7/2020 to 26/6/2021*)
- ❑ **Habilitation for Associate Professor position** (Abilitazione 2^a fascia ASN) obtained on 9/5/2019 for sectors **01/B1 – Informatica** and **09/F2 – Telecomunicazioni**.

PREVIOUS POSITIONS

- ❑ November 1st 2018 – August 31, 2019: I have been on a *sabbatical leave* from my Associate Professor position at Paris Descartes University as **Senior Research Engineer** at the **Mathematical and Algorithmic Sciences Lab, France Research Center, Huawei Technologies**, Paris, where I led a group that included a junior researcher, a Ph.D. student and several stagiaires. I worked on projects related to the analysis, proposition and development of new algorithms for network optimization, with applications to different contexts such as SDN, SD-WAN, load balancing in Data Center Networks, in synergy with the Network Business Unit in Shenzhen. We focused on *routing* and *load balancing optimization*, and more in general on networks, intelligent routing, and applications of *Machine Learning* techniques to routing optimization. The industrial transfer was a key part of my work, and performed in direct contact with the Network BU.
- ❑ 1st September 2010 – November 14, 2019, **Associate Professor (Maître de Conférences, with HDR (Habilitation to Direct Research))** at **Paris Descartes University**.
 - Member of the **Security and Optimization of Communication Systems** team of LIPADE laboratory, and Computer Science department of the University Institute of Technology (IUT), Paris Descartes.
 - **Lecturer** in “Fundamentals of Telecommunications Networks”, “Computer Networks and Operating Systems”, “Network optimization” and “Application of Game Theory to Telecommunications Networks”, graduate and undergraduate courses.
- ❑ 1st September 2015 – 31 August 2017: **visiting associate professor/member of INRIA, DYOGENE** (“en délégation”). During this period, I had the opportunity to collaborate with Dr. Blaszczyszyn on the problem of geographic caching in cellular networks using optimization tools and stochastic geometry, and with Dr. Busic on the problem of storage control in Smart Grids using control and Lagrangian methods.
- ❑ **Research interests:**
 - Network, Routing, and Load Balancing Optimization and Application of Game Theory to Networks (resource allocation, routing, interference mitigation, spectrum access/sharing, network design/formation, and pricing).
 - 5G networks, Cloud-Radio Access Networks, Virtualization, Network Function Virtualization.
 - Internet of (Medical) Things, wearable devices, Wireless Body and Cognitive Radio Networks.

REFEREES

- Prof. **Marwan Krunz** (IEEE Fellow), University of Arizona, USA. E-mail: krunz@email.arizona.edu
- Dr. **Eitan Altman** (IEEE Fellow), INRIA Sophia-Antipolis Méditerranée, France. E-mail: Eitan.Altman@inria.fr
- Prof. **Antonio Capone** (IEEE Fellow), Politecnico di Milano, Milan, Italy. E-mail: antonio.capone@polimi.it
- Prof. **Ian F. Akyildiz** (ACM/IEEE Fellow), Broadband Wireless Networking Lab, Georgia Tech. E-mail: ian@ece.gatech.edu
- Prof. **André-Luc Beylot**, IRT/ENSEEHT, Université de Toulouse. E-mail: andre-luc.beylot@irit.fr

SUMMARY

- ❑ **Publications:** 69 (24 Journal papers, 37 conference papers, 6 national conferences and 2 INRIA reports)
- ❑ **Citations:** 1176, h-index: 20, g-index: 32 (according to *Scholar Google*, March 2022)
- ❑ **Student’s supervision:** 5 Ph.D. students, 4 students in Master 2nd year, and several in Master 1st year.
- ❑ **Main publications:** 1 IEEE TCC, 3 IEEE TVT, 1 IEEE TSC, 1 IEEE TNSM, 10 Elsevier ComNet (1 with 50 citations), 2 Ad Hoc Networks (1 with 98 citations), 1 ComCom, ICC 2012 (115 citations).
- ❑ **Organization of conferences:** MobiHoc 2022, ITC 2021, WiOpt’17, NetGCooP’11, CNSM’11, DNAC’04, Journée du LIPADE 2012.

- ❑ **Industrial contacts:** Huawei Technologies (former Senior Researcher), Nokia Bell Labs France, Orange, CEA, EELEO (I set up French “ANR” projects on green networks and medical applications).

EDUCATION

- ❑ **Habilitation à Diriger des Recherches (HDR)**, obtained on June 26, 2018 at Paris Descartes University.
- ❑ **Qualification for Full Professor position**, obtained at the French national level (Conseil National des Universités, CNU) in section 27 (« Informatique »), February 2019.
- ❑ 1 January 2007 – 31 December 2009: **European Ph.D. Degree** in Information Technology, obtained *cum laude* on 1 October 2010 at the Department of Electronics and Information, Polytechnic of Milan, Italy. Ph.D. thesis title: Overlay Network Formation: Models and Algorithms. Advisor: Prof. Antonio Capone.
- ❑ 1 October 2003 – 3 July 2006: **Ph.D. Degree (Doctorat de l’Université Paris 6)** in Information Technology, Telecommunications and Electronics, obtained *cum laude* on July 3, 2006 at LIP6, Pierre et Marie Curie University (UPMC), Paris, France. “Mention: Très Honorable”. Ph.D. thesis title: Dynamic Bandwidth Allocation in Quality of Service Networks. Advisor: Prof. Guy Pujolle and Dominique Gaiti.
- ❑ **Master’s Degree (DEA, Diplôme d’Études Approfondies)** in Advanced Networks of Knowledge and Organization - Future Intelligent Communication Networks, University of Technology of Troyes, Troyes, France, 2003. “Mention: Très Bien” (*Very Good*).
- ❑ **Master degree** in Computer Science and Telecommunications Engineering, Lebanese University, Faculty of Engineering (ULFG 1), Tripoli, Lebanon, July 2002.

PRIZES AND GRANTS

- ❑ *Prime d’Encadrement Doctoral et de Recherche (PEDR)*, national level (CNU sec. 27) for the period of October 2017-2021 (this includes a net monthly prime of approximately 300 Euros, for the 4 years).
- ❑ *Scientific Excellence Prize (Prime d’Excellence Scientifique, PES)*, national level (CNU sec. 27) for the period of October 2013-2017 (this included a monthly prime of approximately 300 Euros for the 4 years).
- ❑ The paper “A Nash bargaining solution for Cooperative Network Formation Games”, IFIP Networking 2011, was ranked in the **first 3** (ratio 1%) best papers among 64/294 (acceptance rate 21.8%).
- ❑ The paper “A Competitive Interference-aware Spectrum Access in Cognitive Radio Networks”, WiOpt 2010, was ranked in the **first 6** (ratio 5.4%) best papers among 37/112 (acceptance rate 33.0%).
- ❑ I was awarded a Student Travel Grant for the IEEE INFOCOM 2010 Conference (acceptance rate 23%).
- ❑ I was awarded a Travel Grant for the WiOpt conference, 2010.
- ❑ I won the **Best Paper Award** prize at the PhDay 2008 conference (June 2008), organized by the Department of Electronics and Information (DEI) of Politecnico di Milano, Milan, Italy, for the paper entitled “Topology Design and Capacity Dimensioning of Service Overlay Networks”.

RESEARCH GRANTS

- ❑ **Three-year grant** from the **Italian Ministry of Education and University** to accomplish my European Ph.D. studies in Information Technology at the Department of Electronics and Information, Politecnico di Milano, Italy, 1 January 2007- 31 December 2009.
- ❑ **Doctoral Scholarship from CNRS-Lebanon** (National Council for Scientific Research in Lebanon) to accomplish my Ph.D. studies at LIP6, Paris, France, 2003-2006.

SUPERVISION OF PH.D. AND MASTER STUDENTS

I supervised the research activities of several students at the Master level, and I currently (co)supervised five Ph.D. students. I summarize in the two following tables my responsibilities in terms of students’ supervision.

Ph.D. student	Subject	Date	Publications
Bin Xiang	Joint Network Slicing and Mobile Edge Computing	Since 1st November 2017 (Defense 22/6/2021)	3 journal articles, 2 conference papers published
Mira Morcos	Resource Allocation in Virtualized Radio Access Networks	Since 1st November 2015 (Defense 23/1/2019)	4 published articles (1 journal)

Javier Salazar	Cloud computing: Optimization models and algorithms	Since 01/10/2012 (Defense: October 27, 2016)	4 published articles
Amira Meharouech	Wireless Body-to-Body Networks: Optimization Models and Algorithms	Since 01/10/2012 (Defense: December 16, 2016)	7 published articles
Hadda Ben Elhadj	Multi Attribute Decision Making Handover Algorithm for Wireless Body Area Networks	Visiting period: 01/05/2013 – 31/07/2013 (Defense: April 2 nd , 2016)	2 published journal papers

Master Student	Subject	Level	Year
KRASNIQI Filip	End-to-end Delay Prediction Based on Traffic Matrix Sampling	Research training Master 2	2019
CHAHOUDE Ghassane EL MEHDI Safouh	A study of access (MAC) protocols and coupling with a routing algorithm to improve the performance of WBANs	Research project 1 st year of Master	2014/2015
OULLEMINI Mohammed ACHRAF Rafi	Utilization of CPLEX Optimization Studio using two case studies: optimization of wireless networks and wireless sensor networks	Research project 1 st year of Master	2013/2014
ALLADA Henry SAYIN Fatih	Bibliographical and comparative study between TelosB, MicaZ and Shimmer wireless modules	Research project 1 st year of Master	2012/2013
SALAZAR Javier	Optimal Design of Energy-efficient and Cost-effective Wireless Body Area Networks (WBANs)	Research training Master 2	2011/2012
BELLAHESEN Gamliel ABITBOL David	Performance evaluation of WBAN design approaches	Research project 1 st year of Master	2011/2012
AIT HAMMOUD Mohand Amokrane HABIB Hanane	Optimal design of WBANs	Research project 1 st year of Master	2011/2012
JABEUR Jaafar GUECHETOULI Madjid	Green Network Design: A game theoretical approach	Research project 1 st year of Master	2011/2012
RANDRIANARISAINA Andriamampianina Aina	Optimal design of WBAN for improving the network lifetime	Research training Master 2	2010/2011
CALDARA Guido	Green networks optimization	Research training Master 2	2010/2011
MBAYE Elhadji TCHASSOVSKIKH Pavel	Green networks optimization	Research project 1 st year of Master	2010/2011
BEN HAMOUDA Bassem BEN KRAIEM Wassef	A game theoretical design of green networks	Research project 1 st year of Master	2010/2011

PREVIOUS POSITION

- **Post-Doctorate** researcher at the Department of Information Technology and Mathematical Methods, University of Bergamo, Italy, February-August 2010.

RESEARCH ACTIVITY

The main research areas in which I am working are Internet of Things (especially, Wireless Body Area Networks with medical applications), Cloud-Radio Access Networks (Cloud-RAN), Multi-Access Edge Computing (MEC), Virtual Networks and Network Function Virtualization, and Cognitive Radio Networks. I conduct both theoretical and applied research, developing mathematical modeling tools for network optimization (integer, linear and nonlinear programming), stochastic models and game theory for planning and resource allocation, and recently applying Machine Learning techniques to congestion mitigation and routing problems.

Furthermore, within the framework of collaboration with INRIA Paris, I am also working on the problem of optimal storage control in smart grids with two researchers of the DYOGENE team.

In the following, I will briefly summarize the main research activities I carried out in these last years, and outline future research directions.

I. 5G Networks and Beyond

The proliferation of new services and devices as well as the paradigm shift of sectors like industry, healthcare, and transportation towards interconnected systems are calling for the design of more complex architectures and resource management schemes for next generation mobile networks (5G and *Beyond 5G*). Indeed, wireless cellular systems are foreseen as the essential technology to connect all these new devices and enable the integration of these new services. In this scenario I addressed the two following problems:

- **Multi-access Edge Computing (MEC)** facilitates the deployment in 5G and B5G networks of critical applications with stringent QoS requirements, latency in particular. We jointly planned the availability of computational resources at the edge, the slicing of mobile network and edge computation resources, and the routing of heterogeneous traffic types to the various slices. These aspects are intertwined and must be addressed together to provide the desired QoS to all mobile users and traffic types still keeping costs under control.
- **Multi connectivity**
3GPP has recently introduced Multi Connectivity (MC) as a more flexible architecture for 5G NR (New Radio), where multiple wireless connections can be used simultaneously to split or duplicate data traffic. While MC improves single user performance, the inherent increase of data transmissions on the wireless channel may result in higher interference, thus reducing the overall system performance. In this context we analyzed the problem of admission control and resource allocation in multi connectivity scenarios, considering different requirements and 5G New Radio features. We formulated the problem as an optimization program and we provided heuristic approaches to solve it.

Future work: In this context we will further consider distributed approaches (based on the Stackelberg/Leader-Follower paradigm) to perform efficient and scalable resource allocation. Furthermore, we will explicitly address 5G services, including enhanced Mobile Broadband (eMBB) and Ultra Reliable Low Latency Communications (uRLLC) by formulating novel optimization problems and heuristic solutions to effectively solve them.

II. Internet of (Medical) Things and Wireless Body Area Networks

The ongoing evolution of wireless technologies has fostered the development of innovative network paradigms like the Internet of Things (IoT). Mobile medical applications and wearable devices for monitoring, entertainment, sport and medical data collection represent important application areas of IoT. Wireless Body Area Networks (WBANs), and more specifically Body-to-Body Area Networks, are emerging solutions for the monitoring of people's behavior and their interaction with the surrounding environment. In this context, I have investigated two key problems, which are interference mitigation and reliable data communication:

- **Cross-Technology Interference Mitigation in Body-to-Body Area Networks.** The co-existence of several WBANs form a large-scale network called Body-to-Body network (BBN), which presents various challenges at different levels, such as data delivery and routing among WBANs, communication links scheduling and interference mitigation, etc. In this context, I have addressed the interference

mitigation problem using 1) a centralized optimization approach that guarantees low interference and high throughput, and 2) a game-theoretic approach to obtain the same guarantees from a distributed point of view.

- **Optimization and Reliable data communication in Wireless Body Area Networks.** I have also proposed energy-aware optimal design models for WBANs. The main idea was to deploy few relay nodes in the network in order to relay the data of sensors far away from the sink through multi-hop links, thus reducing the energy consumption of sensors and improving the network lifetime. The optimal WBAN topology design model was evaluated considering different body postures' scenarios (i.e., standing, sitting and walking). My contributions in this area have served as a baseline reference for subsequent and current research activities.

Future work. Besides WBAN/healthcare applications described before, application areas of IoT include intelligent transportation systems, environment monitoring, disaster management, home management and monitoring, to cite a few. Furthermore, one of the main breakthroughs of the next generation of mobile networks (5G and beyond/6G) is to design new multiple access and advanced waveform technologies combined with advances in coding and modulation algorithms, which are essential for realizing consistent improvements in spectral efficiency. This will accommodate the necessary scalability not only for massive IoT connectivity but also for Device-to-Device (D2D) and Machine-to-Machine (M2M) communications, along with high bandwidth and drastic reductions in access latency.

In my research activity, I will investigate promising IoT networking application scenarios, along with their interactions with the 5G and beyond technology, D2D and M2M communications while carefully considering the existing IoT standards developed by the standardization organisms and the industry (Cat-1, Cat-0, LTE-M...). Therefore, the first step will be to identify a relevant IoT application scenario and then design and implement paradigm-shifting mechanisms, developing a cross-layer (PHY, MAC and Networking layers) optimization framework to provide seamless, anywhere and anytime network connectivity. The main challenges that I will face while exploring this research area are ensuring efficient resource/spectrum management, guaranteeing a low interference between devices with the coexistence of different wireless technologies and low energy consumption, providing ubiquitous connectivity, low computation, efficient and secure storage, and communications, to cite a few. To address these challenging issues, as I have done in my previous contributions, I will use mathematical as well as simulation tools and open experimental platforms, to develop new, energy-efficient, reliable, secure and lightweight models, protocols and architectures for IoT scenarios. At last, but not at least, I will evaluate the performance of the proposed models, protocols and architectures through extensive numerical simulations and real case studies.

III. Virtualization and Cloud Computing

Network Functions Virtualization (NFV) technology has emerged as a means to reduce capital and operational expenditures (CAPEX/OPEX) of telecommunication operators, offering them some flexibility in operating and orchestrating the resources of their physical infrastructure. Virtualization comes hand in hand with Cloud Computing, providing users with large scale storage and computation services. Optimal resource allocation constitutes a major issue in NFV-based networks and Cloud computing, wherein the main goal of the physical infrastructure provider is to allocate resources in an efficient way in order to satisfy end-users' demands while maximizing its revenue. Therefore, in my previous works I have addressed the congestion mitigation problem in NFV-based networks as well as the resource allocation problem for Infrastructure as a Service (IaaS) in Cloud edge data centers.

Virtualization and cloud computing have also gained momentum in next generation mobile/5G and beyond networks. Virtualization techniques have been deployed at the access network with the emergence of Cloud-Radio Access Networks (C-RAN), and at the core of the mobile network with vEPC (Virtual Evolved Packet Core) and more generally of *network slicing*. Furthermore, Mobile/Multi-Access Edge Computing allows mobile network operators to install data centers at the edge enhancing the Quality of Experience of users and reducing their latency. Therefore, recently, I investigate two major problems: 1) **the resource allocation problem in C-RAN using auction theory** and 2) **the problem of joint optimal planning and computing in 5G networks, with MEC**, using mathematical programming tools. The goal of this latter is to dispatch (or route) user requests/traffics to be processed on data centers guaranteeing low latency and high reliability. The obtained results are very promising and encourage us to pursue advanced research on these two topics.

Future work. In the future, I plan to pursue my work on the problem of resource allocation and optimal planning of next generation mobile networks considering different types of applications/slices and taking into account traffic uncertainty. To deal with traffic uncertainty, I plan to propose some stochastic programming models as well as exact methods (L-Shaped or Dantzig Wolfe Decomposition) and to solve large scale network scenarios, I will also propose efficient heuristics, based for example on problem decomposition. Furthermore, I would like to address the problem of optimal orchestration and management of end-to-end network slices, which consist of RAN and Core network slices. Different solution approaches could be devised to solve this problem: 1) a centralized approach using MILP and heuristics, 2) a distributed (game theory-based) approach and 3) Machine Learning techniques.

IV. Spectrum Access in next-generation mobile networks and Cognitive Radio

Traditionally, Cognitive radio networks (CRNs) are envisioned to deliver high bandwidth to mobile users via heterogeneous wireless architectures and dynamic spectrum access techniques. Such networks provide the capability to share the wireless channel with primary users in an opportunistic manner. Cognitive radio nodes can opportunistically exploit (and aggregate) underutilized licensed and unlicensed spectrum to transmit at higher data rates. These devices are in general geographically distributed, and aim at maximizing their own throughput. Therefore, Game Theory is a good candidate to investigate the spectrum access problem in CRNs where each CR device plays the role of a player.

- **Non-cooperative spectrum access.** I have studied the spectrum access problem in CRNs proposing a non-cooperative spectrum access game. In this game, Secondary Users (SUs or the players) access simultaneously multiple spectrum bands left available by Primary Users (PUs), minimizing the interference with these latter as well as with the other competing SUs. I further extended the idea of adopting a game theoretic approach to the TV White Space context, and proposed non-cooperative games for channel allocation in TV White Space networks.
- **Pricing and network selection.** In this work, I considered a Cognitive Radio scenario which consists of a secondary network that coexists with a primary network, as well as a large set of cognitive users, and I have addressed the joint pricing and network selection problem. The problem was formulated as a Stackelberg (leader-follower) game where first the Primary and Secondary operators compete with each other and set the network subscription price to maximize their revenues. Then, users perform the network selection process, deciding whether to choose the primary network and pay more for a guaranteed service, or use a cheaper, best-effort secondary network, where congestion and low throughput may be experienced.

Future work. The past few years have witnessed the proliferation of wireless devices (cell phones, tablets, sensors, actuators and smart meters...), accompanied by a rapid evolution in the number and variety of applications such as video-streaming, location-based services, mobile healthcare, remote education, home entertainment systems, etc. Most of these devices are unlicensed and operate in the public ISM radio bands, which are becoming increasingly congested. Meanwhile, some licensed spectrum bands in 5G/"5G and Beyond" networks can be extremely underutilized, and hence the cognitive radio technology turns out to be a very promising solution allowing efficient spectrum sharing and better spectrum utilization. I will address the spectrum sharing and aggregation/bonding problems that emerge in this context from different promising perspectives: 1) using a cooperative/centralized approach, 2) a completely distributed one and 3) a hybrid approach.

V. Application of Machine Learning techniques to optimize routing, network planning and resource allocation

I am currently working in Huawei Mathematical and Algorithmic Sciences Lab on projects related to the study, analysis, proposition and development of new algorithms for network optimization, with applications to different contexts, such as SDN (Software Defined Networking), SD-WAN, load balancing in Data Center Networks, in synergy with our "Network Business Unit" in Shenzhen. We focus on projects related to routing and load balancing optimization, and more in general on networks, intelligent routing, and applications of Machine Learning techniques to routing/network performance optimization.

Nowadays, Machine Learning (ML) is gaining momentum in the networking field. Researchers are actively trying to apply ML techniques to improve the control and operation of computer networks. Traditionally, Quality of Service (QoS) metric functions, like delay functions on the transmission links or within network nodes, are modeled under some assumptions using simple models for queueing theory, which may not apply in reality or in general network scenarios. Several factors can have direct or indirect impact on the QoS metric functions: the incoming traffic and its evolution over time, the presence of some anomalies in the network (software or hardware; link or node failures), etc. In our ongoing work, we will try to answer this question: Can ML techniques help us to learn some QoS metric function?

Future work. Knowing that the latency function involved in such problems is likely similar to a MM1 delay function, which is nonlinear, we plan to approximate it by a stepwise function, whose parameters should be chosen in an accurate manner. This can help solving efficiently various network optimization problems we are interested in. Hence, we will apply (semi) supervised ML techniques to learn and determine these parameters taking into account several traffic matrices, network topologies, different network sizes, routing schemes (shortest path, manual routing ...) and queuing policies (PQ, FIFO, WFQ, ...).

VI. Optimal storage control in smart grids under time varying electricity prices

During my two sabbatical years at the DYOGENE team of the INRIA research center in Paris in 2015-2017, I had the opportunity to collaborate with various members of this team (which counts among its members also François Baccelli, recent winner of an ERC Advanced grant), in particular with Dr. Ana Busic, on issues related to smart grids (on which we have a joint ANR project “PARI” financed by the French Ministry of Research, ANR agency) and Dr. Bartek Błaszczyszyn, expert of stochastic geometry. More in detail, in the work with Dr Busic, on optimal storage control in smart grids, we first formulated the optimal control problem of an end user energy storage device in presence of net metering and we proposed a computationally efficient algorithm, with a worst case run time complexity of $O(N^2)$, that computes the optimal energy ramping rates in a time horizon. Then, we tried to mitigate the effect of forecast error on arbitrage gains by considering an Auto-Regressive Moving Average (ARMA) based forecasting of net load together with the Model Predictive Control (MPC). We evaluated our proposed algorithms using real data from Pecan Street and ERCOT price signal.

TEACHING EXPERIENCE

I have a strong teaching experience acquired in the past twelve years. I started to teach in 2005 when I was Ph.D. student at LIP6 (Pierre and Marie Curie University), then as an associate professor at Paris Descartes University, and now as RTDB at University of Bologna. In fact, in the last years, I taught on average 200 hours per year (the service for associate/full professors in France is 192h per year) in France, and 60 hours per year (the required service for an RTDB) in University of Bologna.

Previously (2008-2010), I have taught Labs on Fundamentals of Telecommunications Networks at Politecnico di Milano, and been responsible for the whole course of *Computer Networks* (“**Architetture e Protocolli per Internet**”, 40 hours, from February to August 2010), a graduate course, at University of Bergamo, Italy. Both courses were held in Italian.

My recent courses focus on:

- ❑ Algorithms and Data Structures (course taught in Italian, **Algoritmi e Strutture Dati**), Laurea in Informatica per il Management, Dipartimento di Informatica - Scienza e Ingegneria, University of Bologna.
- ❑ **Fundamentals of Telecommunications Networks, Computer Networks and Operating Systems**, undergraduate courses (“Formation initiale, continue, et en Apprentissage”), Department of Informatics, University Institute of Technology (IUT) Paris Descartes University, 2010-15, 2017-19.
- ❑ **Network optimization and Application of Game Theory to Telecommunications Networks**, graduate course, Maths and Computer Science Faculty of Paris Descartes University, 2010-15 (in English).
- ❑ **Fundamentals of Telecommunications Networks**, graduate course, Polytech (School of Engineering of Paris Sud University), 2015-16.

As highlighted previously I am in direct contact with students since 2005, and based on my experience and the feedback provided by students I developed what I think is an efficient teaching methodology, which balances theoretical courses and practical experimentation/emulation sessions.

The following table summarizes all the courses I taught in the past years, along with the course level, the university and the number of hours per year. The courses I taught at the Master level were held in *English*, those at the undergraduate level (in France) were held in *French*. The courses I am teaching or I taught in University of Bologna, University of Bergamo and Politecnico di Milano were all held in *Italian*.

Academic year	Course	Level	University	Hours
Since 2020	Algorithms and Data Structures (in italian)	Laurea Triennale Informatica per il Management	University of Bologna	60
2010 - 2015 2017 - 2019	Optimization and Quality of Service for E-Health Networks	Master 2 Computer science	Paris Descartes University	12
	Networks and Operating system Engineering	Undergraduate Computer science	IUT Paris Descartes	15
	Operating Systems	Undergraduate Computer science	IUT Paris Descartes	160
2009/2010	Internet Architectures and Protocols (in Italian)	Undergraduate Information Engineering	University of Bergamo	40
	Telecommunications Networks (in italian)	Graduate Information Engineering	University of Bergamo	6
2008/2009	Fundamentals of Telecommunications Networks	Undergraduate Information Engineering	Politecnico di Milano	20
	Computer Networks and Operating Systems	Undergraduate Information Engineering	University of Bergamo	8
2007/2008	Networking Laboratory	Undergraduate Information Engineering	University of Bergamo	4
	Telecommunications Networks	Graduate Information Engineering	University of Bergamo	8
	Fundamentals of Telecommunications Networks	Undergraduate Information Engineering	Politecnico di Milano	20
2005/2006	Operating Systems and Computer Architecture	Undergraduate Computer science	IUT of Marne-la-Vallée, Meaux	36
	Networks	Undergraduate Computer science	IUT of Marne-la-Vallée, Meaux	32
2004/2005	Operating Systems and Computer Architecture	Undergraduate Computer science	IUT of Marne-la-Vallée, Meaux	60
TOTAL				>1500

* During the years 2015-2017 I was on sabbatical leave ("en délégation") at INRIA Paris, working in the Dyogene (networking) team.

TEACHING ADMINISTRATION

I have been extensively involved in several managing aspects of the Department of Informatics of the University Institute of Technology (IUT), Paris Descartes University, in terms of teaching organization, recruitment and curriculum development, in particular:

- ❑ I am constantly engaged in defining, rethinking and maintaining up-to-date all programs of networking and operating systems courses of the second year of the computer science curriculum at IUT Paris Descartes (undergraduate level). This further involves discussions with colleagues of the same department as well as from other departments.
- ❑ Since September 2010, I am member of the commission responsible of the selection and admission of students at the IUT of Paris Descartes University (admission of 200 students among approximately 3000 candidates per year).
- ❑ In 2015, I set up an Erasmus+ exchange program, which is still active, between Université Paris Descartes and University of Padova.
- ❑ I have been Member of the B.Sc. and M.Sc. programs in Information Engineering, University of Bergamo, 2010. This task included the development of the computer science curriculum, and in particular of the courses related to the *networking* area, of which I was responsible.
- ❑ I am member of "Cahier du LIPADE" committee, which manages, validates and publishes the research reports of the LIPADE laboratory, since January 2011.

TALKS AND SEMINARS

During the last years, I have been invited to hold seminars on my research topics at the following Universities and Research groups:

- ❑ Seminar, **“On Efficient Resource Management in Next-Generation Networks: Optimization, Game Theoretical Models, and Algorithms”**, Laboratory ETIS, University of Cergy-Pontoise, April 24, 2019.
- ❑ Seminar, **“On Efficient Resource Management in Next-Generation Networks: Optimization, Game Theoretical Models, and Algorithms”**, Laboratory Liparad, University of Versailles Saint-Quentin-en-Yvelines, April 10, 2019.
- ❑ Seminar, **“Stochastic Optimization Models for Virtual Content Delivery Network Planning”**, ROADEF 2016, Compiègne, France, February 10-12, 2016.
- ❑ Invited seminar, **“Modeling and Performance Evaluation of Resource Allocation Problems in TV White Space and NFV-based Networks”**, LINCS, Paris, 14 October 2015.
- ❑ Invited seminar, **“Modeling and Performance Evaluation of Wireless Networks”**, INRIA – DYOGENE, Paris, 13 Mars 2015.
- ❑ Invited seminar, **“Optimal design of energy-efficient and cost-effective Wireless Body Area Networks”**, national meeting of GDR SoC-SiP (System On Chip – System In Package), Paris, June 2014.
- ❑ Invited seminar, **“Computer Networks: Optimization, Resource Management, Routing and Pricing”**, LIA Laboratory, University of Avignon, May 23, 2014.
- ❑ Seminar, **“Cross Technology Interference Mitigation in Body-to-Body Area Networks”**, IEEE WoWMoM 2013, Madrid, Spain, June 2013.
- ❑ Seminar, **“Energy-aware Topology Design for Wireless Body Area Networks”**, IEEE ICC 2012, Ottawa, Canada, June 2012.
- ❑ Seminar, **“Optimal Design of Wireless Body Area Networks”**, Journée du LIPADE, Paris, June 16, 2011.
- ❑ Seminar **“Competitive Interference-aware Spectrum Access in Cognitive Radio Networks”**, 7th EuroNF Workshop on Wireless and Mobility in the Network of the Future, Villa Vigoni, Como, Italy, June 21, 2010.
- ❑ Seminar **“Competitive Interference-aware Spectrum Access in Cognitive Radio Networks”**, WiOpt 2010, Avignon, France, May 31- June 4, 2010.
- ❑ Seminar, **“Network Optimization and Resource Management: Models and Algorithms”**, LIPADE, Paris, April 21, 2010.
- ❑ Seminar, **“Socially-Aware Network Design Games”**, IEEE Infocom 2010, San Diego, CA, USA, March 2010.
- ❑ Seminar, **“Overlay Networks Formation: Models and Algorithms”**, Dipartimento di Elettronica e Informazione (DEI), Politecnico di Milano, Italy, March 2010.
- ❑ Seminar, **“A Game Theoretic Framework for joint Routing and Pricing in Networks with Elastic Demands”**, Valuetools’09 Conference, Pisa, Italy, October 2009.
- ❑ Seminar, **“Joint routing and pricing in communications networks with elastic traffic: a game theoretical perspective”**, INRIA-Sophia Antipolis MAESTRO Retreat, Avignon, France, September 2009.
- ❑ Seminar **“Very Large-Scale Neighborhood Search Algorithms for the Design of Service Overlay Networks”**, Italian Networking Workshop, Cortina d’Ampezzo, Italy, January 2009.
- ❑ Seminar **“Optimal Design of Service Overlay Networks”**, INRIA Sophia Antipolis – Méditerranée, France, October 2008.
- ❑ Seminar **“Neighborhood based heuristics for the Hub Location Problem”**, Dipartimento di Elettronica e Informazione (DEI), Politecnico di Milano, Italy, September 2008.
- ❑ Seminar **“Topology Design and Capacity Dimensioning of Service Overlay Networks”**, PhDay 2008 conference, DEI, Politecnico di Milano, Italy, June 2008.
- ❑ Seminar **“Dynamic Bandwidth Allocation in Communication Networks”**, Italian Networking Workshop, Bardonecchia, Italy, January 2007.
- ❑ Seminar **“Dynamic Resource Allocation in Communication Networks”**, Networking 2006, Coimbra, Portugal, May 2006.
- ❑ Seminar **“Distributed Dynamic Bandwidth Provisioning in Quality of Service Networks”**, 3rd EuroNGI Workshop on QoS and Traffic Control, Ecole Normale Supérieure (ENS), Paris, France, December 2005.
- ❑ Seminar **“Dynamic Resource Allocation in Quality of Service Networks”**, Second EuroNGI Workshop on New Trends in Network Architectures and Services, Villa Vigoni, Como, Italy, July 2005.

PARTICIPATION TO NATIONAL AND INTERNATIONAL RESEARCH PROJECTS

- ❑ **January 2017 – December 2019:** Participation to the ANR JCJC PARI project - Probabilistic Approach for Renewable Energy Integration: Virtual Storage from Flexible Loads, led by Dr. Ana Busic.
- ❑ **February-August 2010:** Participation to the **PrimeLife project** (Privacy and Identity Management in Europe for Life), funded by the **European Commission's 7th Framework Programme**, as a Post-doc at the University of Bergamo. Within this project I have studied distributed and complex systems using the Game Theory paradigm. Research unit: University of Bergamo. Project coordinator: Prof. Stefano Paraboschi.
- ❑ **September 2008-September 2010:** Participation to the **PRIN 2007 SESAME project** (Scalable Efficient Secure Autonomic MESH networks), funded by the **Italian Ministry of Education and University**, for which I have studied and implemented novel algorithms and protocols for Wireless Mesh Networks. Research unit: Politecnico di Milano. Project coordinator: Prof. Antonio Capone.
- ❑ **2007-2009:** Participation to the **Network of Excellence EURO-NF: Anticipating the Network of the Future – From Theory to Design**. Within this project, I have investigated the applications of game theory to networks in general and overlay networks in particular, and I have spent 7 months as visiting researcher at the MAESTRO team, INRIA-Sophia Antipolis, France, in 2008-2009.

ACTIVE COLLABORATIONS WITH INTERNATIONAL RESEARCH GROUPS AND RESEARCHERS

- ❑ **DYOGENE team (Dynamics of Geometric Networks, scientific leader Marc Lelarge) at INRIA de Paris** (2 rue Simone Iff, 75589 Paris Cedex 12). I was a member of the DYOGENE team in an "en délégation" position; they are positions that INRIA annually sponsors and makes available with a national competition (assigned by an INRIA recruitment committee) for researchers and university professors. In my case, I was admitted and financed for the maximum allowed period (2 years). I collaborated with various members of DYOGENE (which counts among its members also François Baccelli, recent winner of an ERC Advanced grant), in particular with Dr. Ana Busic, on issues related to smart grids (on which we have joint publications and the approved ANR project "PARI", Probabilistic Approach for Renewable Energy Integration: Virtual Storage from Flexible Loads) and Dr. Bartek Błaszczyszyn, expert of stochastic geometry (1 article at WiOPT 2017).
More in detail, in the work with Dr Busic, on optimal storage control in smart grids, we first formulate the optimal control problem of an end user energy storage device in presence of net metering and we propose a computationally efficient algorithm, with a worst case run time complexity of $O(N^2)$, that computes the optimal energy ramping rates in a time horizon. Then, we try to mitigate the effect of forecast error on arbitrage gains by considering an Auto-Regressive Moving Average (ARMA) based forecasting of net load together with the Model Predictive Control (MPC). We evaluate our proposed algorithms using real data from Pecan Street and ERCOT price signal.
- ❑ **Department of Electrical and Computer Engineering (ECE), University of Arizona.** I have been collaborating for several years with Prof. Marwan Krunz (Editor-in-Chief of IEEE Trans. On Mobile Computing), and he has been in June 2018 a member of my HDR Jury (French National Qualification for professor positions). We worked together on channel allocation issues in cognitive, TV White Space networks as well as wireless body area networks. This collaboration has already led to the publication of 2 articles in IEEE Trans. on Vehicular Technology (2014 and 2016) and one at an international conference (IFIP Networking 2015).
- ❑ **City University of Hong Kong.** In 2013, I initiated a collaboration with Prof. Jianping Wang on the problem of congestion minimization in NFV-based networks (Network Functions Virtualization). We have published two articles together on this topic, in IEEE Trans. on Services Computing and IEEE ICNP, in 2015 and 2014, respectively.
- ❑ Research team **MAESTRO (now NEO), INRIA Sophia Antipolis – Méditerranée.** I am collaborating with the members of the MAESTRO team on several issues related to game theory applications to computer networks and network design. I have spent several months at the **MAESTRO** team (Director, Dr. Philippe

Nain): December 2013, from October 15, 2008 to January 15, 2009 and from July 1, 2009 to October 25, 2009.

References: Dr. Philippe Nain, Dr Alain Jean-Marie and Dr. Konstantin Avrachenkov, INRIA Sophia Antipolis, 2004 Route des Lucioles - B.P. 93 FR - 06902 Sophia Antipolis Cedex, France.

- ❑ **LIA (Laboratoire Informatique d'Avignon), Université d'Avignon et des Pays de Vaucluse.** I am collaborating with Dr. Altman (IEEE Fellow) and other members of LIA (*Prof. Rachid El-Azouzi*) on several research topics related to Game Theory: selfish routing in telecommunications networks, dynamic spectrum access in Cognitive Radio Networks, and economic interactions between (Internet) Service Providers and users. I have been invited by Dr. Eitan Altman at the LIA from October 26 to November 15, 2009.

Reference: Dr. Eitan Altman, INRIA Sophia Antipolis, 2004 Route des Lucioles - B.P. 93 FR - 06902 Sophia Antipolis Cedex, France.

- ❑ **Advanced Network Technologies Laboratory (ANTLab), Department of Electronics and Information, Politecnico di Milano.** I have a long-standing collaboration with Professor Antonio Capone, in particular, with whom I am currently co-supervising a Ph.D. student (Mr. Bin Xiang) on problems related to network slicing and mobile edge computing. Recently, I also co-supervised with him a Ph.D. student (Dr. Michele Mangili), on the planning of virtual mobile networks. In the past, I have worked with Professors Antonio Capone and Luigi Fratta on the problem of dynamic bandwidth allocation in QoS networks. We have proposed a new service model and a broad set of efficient dynamic bandwidth allocation algorithms that take explicitly into account traffic statistics measured on-line and users' utility functions to increase users' benefit and network revenue.

During my PhD studies at LIP6 laboratory, I have spent several months at ANTLab, during May-July 2005, January-April 2006 and July-December 2006.

References: Prof. Antonio Capone and Prof. Luigi Fratta, Politecnico di Milano, 32, Piazza Leonardo da Vinci, 20133, Milano, Italy.

- ❑ **Laboratoire de Recherche en Informatique (LRI), Université Paris-Sud** (currently 42nd worldwide according to the Shanghai ranking 2018). I am "associate member" (position assigned and renewed annually by the Scientific Council of the Laboratory) at LRI. Since 2012, I collaborate with the members of the GALAC team (Graphs, Algorithms and Combinatorics), and we have several joint publications (in particular with Dr. Lin Chen, bronze medalist at CNRS 2018 and junior member of the Institut Universitaire de France from 2018, and Prof. Fabio Martignon, IUF member in the period 2013-2017). In this regard, I have also co-supervised the doctoral thesis of Dr. Mira Morcos (from 1/11/2015 to the defense date set for 23/1/2019), publishing together several articles in a journal and conferences (see my list of publications; advisor: Dr. Lin Chen).

- ❑ **LIP6 Laboratory, University of Pierre et Marie Curie.** Since 2003, I have collaborated with the LIP6 networking research team on issues related to dynamic resource allocation in Quality of Service networks.

- ❑ **Operations Research and Discrete Optimization Group, Politecnico di Milano (Italy).** I have worked with the Network Optimization (NeO) laboratory in Politecnico di Milano on extending the Hub Location problem to the overlay network design problem.

- ❑ **Department of Management, Information and Production Engineering (DIGIP), University of Bergamo:** a fruitful collaboration exists with the DIGIP department since 2005, on several research issues like network design and dynamic bandwidth allocation in telecommunications networks. I have been Visiting Researcher at DIGIP in 2005-2006, and very recently in April-May 2018, October-November 2019.

Reference: Prof. Stefano Paraboschi, University of Bergamo, Dalmine (BG) 24044, Italy.

- ❑ **IMAGINE (Intelligence for Mobile Autonomic and Cognitive Networks) Laboratory, School of Information Technology and Engineering (SITE), University of Ottawa.** Since January 2012, I am collaborating with Prof. Ahmed Karmouch on two main research issues: efficient resource allocation in the Mobile/Edge Cloud, and reliable and energy-efficient design of wireless body area networks.

Reference: Prof. Ahmed Karmouch, University of Ottawa, School of Electrical Engineering and Computer Science (EECS), University of Ottawa, 800 King Edward Avenue, Ottawa, Ontario, Canada.

These fruitful collaborations have led to publications in prestigious journals and conferences, with the following co-authors:

- **Eitan Altman**, Research Director, IEEE Fellow, INRIA, Sophia-Antipolis.
- **Marwan Krunz**, Professor, IEEE Fellow, University of Arizona.
- **Antonio Capone**, Professor at DEIB, IEEE Fellow, Politecnico di Milano, Italy.
- **Jianping Wang**, Associate Professor, City University of Hong Kong.
- **Leon Petrosyan**, Professor and Director of the Game Theory Center, Saint Petersburg State University, Russia.
- **Fabio Martignon**, Professor, University of Bergamo.
- **Konstantin Avrachenkov**, Director of Research, INRIA, Sophia-Antipolis.
- **Lin Chen**, Full Professor, School of Data and Computer Science, Sun Yat-sen (Zhongshan) University
- **Giuliana Carello**, Associate Professor, Operations Research and Discrete Optimization Group, DEI, Politecnico di Milano, Italy.
- **Giovanni Neglia**, Senior Research Scientist, INRIA, Sophia-Antipolis.
- **Ahmed Karmouch**, Professor, University of Ottawa.

PhD DEFENSE JURY

- **Reviewer** and **member** of the Ph.D. examination Jury of Mr. **Marco ZAMBIANCO**, Politecnico di Milano, February 2022.
- **Member** of the Ph.D. examination Jury of Mrs. **Marie MASSON**, Université d'Avignon, December 15, 2021.
- **Reviewer** and **member** of the Ph.D. examination Jury of Mr. **Yonathan PORTILLA**, University of Avignon, May 20, 2019.
- **Co-supervisor** of the Ph.D. thesis of Mrs. **Mira MORCOS**, LINCOS, Télécom ParisTech, January 23, 2019.
- **Member** of the Ph.D. Examination Jury of Mrs. **Hang NGUYEN**, University of Toulouse, CNRS-LAAS, December 4, 2018.
- **Member** of the Ph.D. Examination Jury of Mr. **Jonatan KROLIKOWSKI**, Paris 6 University (Sorbonne Université), November 6, 2018.
- **Co-supervisor** of the Ph.D. thesis of Mrs. **Amira MEHAROUËCH**, LIPADE, Paris Descartes University, December 16, 2016.
- **Co-supervisor** of the Ph.D. thesis of Mr. **Javier SALAZAR**, LIPADE, Paris Descartes University, October 27, 2016.
- **Member** of the Ph.D. Examination Jury of Mr. **Jihong YU**, LRI, Paris-Sud University, December 6, 2016.
- **Member** of the Ph.D. Examination Jury of Mr. **Mario ALVARADO**, Telecom ParisTech, September 25, 2015.

EXPERIENCE IN REVIEW AND CONFERENCE ORGANIZATION

- ❑ Since November 2017 I am *member of the Technical Committee in the Elsevier Computer Communications Editorial Board*.
- ❑ I have been regularly a reviewer for international networking journals and conferences such as Elsevier Computer Communications, Elsevier Computer Networks, Elsevier Ad Hoc Networks, IEEE Transactions on Wireless Communications, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Parallel and Distributed Systems, IEEE Transactions on Vehicular Technology, IEEE Transactions on Information Technology in Biomedicine, Wiley Wireless Communications and Mobile Computing, International Journal of Ad Hoc and Ubiquitous Computing (IJAHUC), International Journal of Sensor Networks (IJSNET), IEEE INFOCOM, IEEE GLOBECOM, IEEE ICC, IEEE-IFIP Net-Con, IFIP Wireless Days, NetGCoop, International Conference on Computer and Network Technology (ICCNT), IEEE International Workshop on CAMAD, Next Generation Internet (NGI).

- ❑ I have participated to the organization of several conferences and events:
 - **MobiHoc 2022** (23rd International Symposium on Theory, Algorithmic Foundations, and Protocol Design for Mobile Networks and Mobile Computing), Seoul, South Korea, October 17-22, 2022
 - Publicity Chair
 - **ITC 2021** (ITC'33 - Networked Systems and Services), Avignon, France, August 31st – Sep. 3rd 2021
 - Publication Chair
 - **WiOpt 2017** (15th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks), Paris, France, 15th - 19th May, 2017.
 - Publication Chair,
 - **NetGCooP 2011** (International Conference on NETwork Games, COntrol and Optimization, <http://netgcoop.imag.fr/>), Paris Descartes University, October 12-14, 2011 (100 participants).
 - Organizing Committee Co-Chair,
 - Chairman for the Green Networking session of NetGCooP 2011, October 12, 2011.
 - **CNSM 2011** (Conference on Network and Service Management, <http://cnsm.loria.fr/>), 12 rue de l'Ecole de Médecine, Paris Descartes University, October 24-28, 2011.
 - **Congrès DNAC 2004** – PARIS'04-“Contrôle, Maitrise et Autonomie des Réseaux – Qualité de Service, Sécurité, Mobilité”, Paris, France, November 29-December 1, 2004.
 - **Journée du LIPADE 2012**, 45, rue des Saints Pères, Paris, 21 June 2012.

OTHER SCIENTIFIC ACTIVITIES

- ❑ TPC (Technical Program Committee) member of
 - MobiHoc 2022, 2021, 2020
 - WiOpt 2022, 2019, 2017
 - IEEE ICC 2022, 2021, 2020, 2019 - NGNI Symposium, IEEE ICC 2017 - SAC 3 CCN, IEEE ICC 2015 - Workshop on Cloud Computing Systems, Networks, and Applications (CCSNA).
 - IEEE EDGE 2022
 - IEEE WCNC 2021, 2020, 2019, IEEE WCNC Workshop (IoT-Health) 2018, IEEE WCNC 2016 - Track 3 - Mobile and Wireless Networks.
 - IEEE VTC 2017 Fall - Track: 3 - Cognitive Radio and Spectrum Management.
 - IEEE INFOCOM 2016 - Workshop of Green and Sustainable Networking and Computing (GSNC).
 - IEEE GLOBECOM - Workshop SAC CN 2016, 2015.
 - Wireless Days 2019, 2018, 2017, 2016, 2014.
 - IEEE ICCVE (International Conference on Connected Vehicles & Expo) 2019, 2014, 2013.
 - WINSYS (Int. Conference on Wireless Information Networks and Systems) 2016, 2014, 2013, 2012.
 - NetGCooP 2018, 2016, 2014, 2012 and 2011 (International Conference on NETwork Games, Control and Optimization).
 - CFIP NOTERE 2018, 2016, 2015,
 - CloT 2018, 2016 and 3ICT 2019 (2019 International Conference on Innovation and Intelligence for Informatics, Computing, and Technologies)
- ❑ “Assesseeur” and member of the commission for hiring an associate professor at IUT of Paris Descartes University, 2012 (position 27MCF0321, Section 27, Computer Science).
- ❑ Member of “Cahier du LIPADE”, who manages, validates and publishes the research reports of the LIPADE laboratory, January 2011 - November 2019.
- ❑ Proposal Reviewer for the Qatar National Research Fund (QNRF), National Priorities Research Program (NPRP) and Postdoctoral Research Award (PDRA), February-March, 2014-2019.
- ❑ Proposal Reviewer for the Italian MUR “PRIN 2020” Program, 2021.
- ❑ Proposal Reviewer for the Italian MIUR “Progamma per giovani ricercatori Rita Levi Montalcini”, July-August 2018.

LIST OF PUBLICATIONS

Downloadable versions of my papers are available at

<https://www.unibo.it/sitoweb/jocelyne.elias/pubblicazioni>

<https://helios2.mi.parisdescartes.fr/~jelijas/publications.html> (up to 2019)

My *h-index* is 20, my *g-index* is 32. Total number of citations: 1176 (731 since 2017, Google Scholar).

International Peer-Reviewed Journals (24)

1. B. Xiang, J. ELIAS, F. Martignon, E. Di Nitto, **Joint Planning of Network Slicing and Mobile Edge Computing: Models and Algorithms**, in IEEE Transaction on Cloud Computing, accepted in August 2021, Early Access.
2. Y. Al-Najjar, W. Ben-Ameur, J. Leguay, J. ELIAS, **Affine routing for robust network design**, Networks, 2021, Early Access, pp. 1 – 32.
3. B. Xiang, J. ELIAS, F. Martignon, E. Di Nitto, **Resource calendaring for Mobile Edge Computing: Centralized and decentralized optimization approaches**, Elsevier Computer Networks, 2021, vol. 199, pp. 1-21
4. B. Xiang, J. ELIAS, F. Martignon, E. Di Nitto, **A dataset for mobile edge computing network topologies**, Elsevier Data in Brief, 2021, 39, pp. 1 – 6.
5. A. Meharouech, J. ELIAS, A. Mehaoua, **Moving towards Body to Body Sensor Networks for Ubiquitous Applications: A survey**, Journal of Sensor and Actuator Networks, vol. 8, n.2, May 2019.
6. M. Morcos, T. Chahed, L. Chen, J. ELIAS, F. Martignon, **A Two-level Auction for Resource Allocation in Multi-tenant C-RAN**, Elsevier Computer Networks, vol. 135, pp. 240-252, April 2018.
7. A. Jarray, A. Karmouch, J. Salazar, J. ELIAS, A. Mehaoua, F. Zaman, **Efficient resource allocation and dimensioning of media edge clouds infrastructure**, Journal of Cloud Computing: Advances, Systems and Applications, vol. 6, issue 1, 27 pages, December 2017.
8. J. ELIAS, F. Martignon, S. Paris, J. Wang, **Efficient Orchestration Mechanisms for Congestion Mitigation in NFV: Models and Algorithms**, IEEE Transactions on Services Computing, vol. 10, issue 4, pages 534-546, July-August 2017.
9. M. Mangili, J. ELIAS, F. Martignon, A. Capone, **Optimal Planning of Virtual Content Delivery Networks under Uncertain Traffic Demands**, Elsevier Computer Networks, vol. 106, pp. 186-195, 4 September 2016.
10. J. ELIAS, F. Martignon, L. Chen, M. Krunz, **Distributed Spectrum Management in TV White Space Networks**, IEEE Transactions on Vehicular Technology, vol. 66, issue 5, pp. 4161-4172, 3 August 2016.
11. H.B. Elhadj, J. ELIAS, L. Chaari, L. Kamoun, **Multi Attribute Decision Making Handover Algorithm for Wireless Body Area Networks**, Elsevier Computer Communications, vol. 81, pages 97-108, May 2016.
12. H.B. Elhadj, J. ELIAS, L. Chaari, L. Kamoun, **A Priority based Cross Layer Routing Protocol for healthcare applications**, Elsevier Ad Hoc Networks, vol. 42, pages 1-18, May 2016.
13. A. Meharouech, J. ELIAS, A. Mehaoua, **A Two-Stage Game Theoretical Approach for Interference Mitigation in Body-to-Body Networks**, Elsevier Computer Networks, vol. 95, pp. 15-34, February 2016.
14. J. ELIAS, S. Paris, M. Krunz, **Cross Technology Interference Mitigation in Body Area Networks: an Optimization Approach**, IEEE Transactions on Vehicular Technology, Vol. 64, Issue 9, pages 4144-4157, September 2015.
15. K. Avrachenkov, J. ELIAS, F. Martignon, G. Neglia, L. Petrosyan, **Cooperative Network Design: a Nash bargaining solution approach**, Elsevier Computer Networks, vol. 83, pages 265-279, 4 June 2015.
16. J. ELIAS, **Optimal design of energy-efficient and cost-effective Wireless Body Area Networks**, Elsevier Ad Hoc Networks, vol. 13, pages 560-574, February 2014 (63 citations).
17. J. ELIAS, F. Martignon, L. Chen, E. Altman, **Joint Operator Pricing and Network Selection Game in Cognitive Radio Networks: Equilibrium, System Dynamics and Price of Anarchy**, IEEE Transactions on Vehicular Technology, vol. 62, issue 9, pages 1-14, November 2013.
18. J. ELIAS, F. Martignon, G. Carello, **Very Large-Scale Neighborhood Search Algorithms for the Design of Service Overlay Networks**, Telecommunication Systems, vol. 49, no. 4, pages 391-408, 2012.

19. J. ELIAS, F. Martignon, A. Capone, E. Altman, **Non-Cooperative Spectrum Access in Cognitive Radio Networks: a Game Theoretical Model**, Elsevier Computer Networks, vol. 55, issue 17, pages 3832-3846, December 2011.
20. J. ELIAS, F. Martignon, K. Avrachenkov, G. Neglia, **A Game Theoretic Analysis of Network Design with Socially-Aware Users**, Elsevier Computer Networks, vol. 55, n. 1, pages 106-118, January 2011.
21. A. Capone, J. ELIAS, F. Martignon, **Routing and Resource Optimization in Service Overlay Networks**, Elsevier Computer Networks, vol. 53, n. 2, pp. 180-190, February 2009.
22. A. Capone, J. ELIAS, F. Martignon, **Models and Algorithms for the Design of Service Overlay Networks**, IEEE Transactions on Network and Service Management, vol. 5, n. 3, pp. 143-156, September 2008.
23. J. ELIAS, F. Martignon, A. Capone, G. Pujolle, **A New Approach to Dynamic Bandwidth Allocation in Quality of Service Networks: Performance and Bounds**, Elsevier Computer Networks, vol. 51, n. 10, pp. 2833-2853, 11 July 2007.
24. J. ELIAS, F. Martignon, A. Capone, G. Pujolle, **Distributed Algorithms for Dynamic Bandwidth Provisioning in Communication Networks**, Journal of Communications (JCM), vol. 1, n. 7, pp. 47-56, November-December 2006.

International Peer-Reviewed Conferences (37)

1. E. Benedetto, I. Filippini, J. ELIAS, F. Martignon, Y. Shen, **Semi-distributed Traffic Engineering for Elastic Flows in Software Defined Networks**, in ICC 2022 - IEEE International Conference on Communications, 2022.
2. J. ELIAS, F. Martignon, S. Paris, **Optimal Split Bearer Control and Resource Allocation for Multi-Connectivity in 5G New Radio**, in 2021 Joint European Conference on Networks and Communications & 6G Summit (EuCNC/6G Summit), 2021, pp. 187 - 192
3. B. Xiang, J. ELIAS, F. Martignon, E. Di Nitto, **Resource Calendaring for Mobile Edge Computing in 5G Networks**, in ICC 2021 - IEEE International Conference on Communications, 2021.
4. F. Krasniqi, J. ELIAS, J. Leguay, A.E.C. Redondi, **End-to-end Delay Prediction Based on Traffic Matrix Sampling**, in IEEE Infocom Workshops 2020, IEEE, 2020, pp. 774 - 779
5. Y. Al Najjar, J. ELIAS, J. Leguay, W. Ben Ameer, **Optimal routing configuration clustering through dynamic programming**, accepted for publication in International Network Optimization Conference, INOC 2019, Avignon, France, June 2019 (extended abstract).
6. B. Xiang, J. ELIAS, F. Martignon, E. Di Nitto, **Joint Network Slicing and Mobile Edge Computing in 5G networks**, IEEE ICC 2019, Shanghai, China, 20-24 May, 2019.
7. M. Morcos, J. ELIAS, F. Martignon, L. Chen, T. Chahed, **A Combinatorial Auction for Joint Radio and Processing Resource Allocation in C-RAN**, IEEE ICC 2019, Shanghai, China, 20-24 May, 2019.
8. J. ELIAS, F. Martignon, M. Mangili, A. Capone, **Optimal Planning of Virtual Mobile Networks**, in IEEE WCNC 2018, Barcelona, Spain, 15-18 April, 2018.
9. J. ELIAS, F. Martignon, M. Morcos, L. Chen, T. Chahed, **Radio Resource Calendaring in Cloud-based Radio Access Networks**, in the 10th Wireless Days Conference, Dubai, April 2018.
10. M.U. Hashmi, A. Mukhopadhyay, A. Busic, J. ELIAS, **Optimal Control of Storage under Time Varying Electricity Prices**, IEEE International Conference on Smart Grid Communications (SmartGridComm): Control and Operation of Responsive Grids symposium, 21 July 2017.
11. J. ELIAS, B. Blaszczyzyn, **Optimal geographic caching in cellular networks with linear content coding**, in the 15th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt 2017): The 2nd Content Caching and Delivery in Wireless Networks Workshop (CCDWN), Paris, France, 15-19 May 2017.
12. A. Meharouech, J. ELIAS, A. Mehaoua, **Joint Epidemic Control and Routing in Mass Gathering Areas using Body-to-Body Networks**, in the 13th International Wireless Communications and Mobile Computing Conference (IWCMC 2017): e-Health Symposium, Valencia, Spain, 26-30 June, 2017.
13. M. Morcos, T. Chahed, L. Chen, J. ELIAS, F. Martignon, **A Two-level Auction for C-RAN Resource Allocation**, ICC 2017: International workshop on the main trends in 5G networks (MT5Gnet), Paris, France, 21-25 May 2017.
14. L. Lahlou, A. Meharouech, J. ELIAS, A. Mehaoua, **MAC-Network Cross-Layer Energy Optimization model for Wireless Body Area Networks**, Joint 16th CFIP & 12th NOTERE, Paris, France, July 2015.

15. A. Meharouech, J. ELIAS, A. Mehaoua, **Future Body-to-Body Networks for Ubiquitous Healthcare: A Survey, Taxonomy and Challenges**, Ubi-HealthTech 2015, Beijing, China, 28-30 May 2015.
16. J. ELIAS, M. Krunz, **Distributed Spectrum Management in TV White Space Cognitive Radio Networks**, IFIP Networking 2015, Toulouse, France, May 2015.
17. A. Meharouech, J. ELIAS, S. Paris, A. Mehaoua, **A Game Theoretical Approach for Interference Mitigation in Body-to-Body Networks**, IEEE ICC'15 - Workshop on ICT-enabled services and technologies for eHealth and Ambient Assisted Living, London, UK, June 2015.
18. A. Jarray, J. Salazar, A. Karmouch, J. ELIAS, A. Mehaoua, **QoS-based Cloud Resources Partitioning Aware Networked Edge Datacenters**, IFIP/IEEE IM 2015, Ottawa, Canada, May 2015.
19. J. ELIAS, F. Martignon, S. Paris, J. Wang, **Optimization Models for Congestion Mitigation in Virtual Networks**, in Proceedings of the 22nd IEEE International Conference on Network Protocols (ICNP 2014), Concise Papers Track (acceptance rate: 18.9%, 15 papers out of 79 submissions).
20. A. Meharouech, J. ELIAS, S. Paris, A. Mehaoua, **Socially-Aware Interference Mitigation Game in Body-to-Body Networks**, in Proceedings of the International Conference on NETwork Games COntrol and oPTimization 2014 (NETGCOOP 2014), short paper, Trento, Italy, October 29-31, 2014.
21. A. Jarray, J. Salazar, A. Karmouch, J. ELIAS, A. Mehaoua, **Column Generation based-Approach for IaaS Aware Networked Edge Data-Centers**, in Proceedings of IEEE Globecom 2014 Workshop - The 2nd International Workshop on Cloud Computing Systems, Networks, and Applications (CCSNA), Austin, Texas, December 2014.
22. J. ELIAS, A. Jarray, J. Salazar, A. Karmouch, A. Mehaoua, **A Reliable Design of Wireless Body Area Networks**, in Proceedings of IEEE GLOBECOM 2013, Atlanta, USA, December 2013.
23. S. Paris, J. ELIAS, A. Mehaoua, **Cross Technology Interference Mitigation in Body-to-Body Area Networks**, in Proceedings of IEEE WoWMoM 2013, Madrid, Spain, June 4-7, 2013.
24. J. ELIAS, F. Martignon, E. Altman, **Joint Pricing and Cognitive Radio Network Selection: a Game Theoretical Approach**, in Proceedings of WiOpt 2012, Paderborn, Germany, May 2012.
25. J. ELIAS, A. Mehaoua, **Energy-aware Topology Design for Wireless Body Area Networks**, in Proceedings of IEEE ICC 2012, Ottawa, Canada, June 2012 (88 citations).
26. K. Avrachenkov, J. ELIAS, F. Martignon, G. Neglia, L. Petrosyan, **A Nash bargaining solution for Cooperative Network Formation Games**, in Proceedings of Networking 2011, Valencia, Spain, May 2011 (26 citations).
27. J. ELIAS, F. Martignon, A. Capone, E. Altman, **Competitive Interference-aware Spectrum Access in Cognitive Radio Networks**, in Proc. of the 8th Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks, WiOpt 2010, Avignon, France, June 2010.
28. J. ELIAS, F. Martignon, **Joint Spectrum Access and Pricing in Cognitive Radio Networks with Elastic Traffic**, in IEEE ICC 2010, Cape Town, South Africa, May 2010.
29. J. ELIAS, F. Martignon, **Joint QoS Routing and Dynamic Capacity Dimensioning with Elastic Traffic: A Game Theoretical Perspective**, in IEEE International Conference on Communications, ICC 2010, Cape Town, South Africa, May 2010.
30. J. ELIAS, F. Martignon, K. Avrachenkov, G. Neglia, **Socially-Aware Network Design Games**, in Proceedings of the 29th IEEE Conference on Computer Communications (INFOCOM 2010), March 2010, San Diego, CA, USA (22 citations).
31. E. Altman, J. ELIAS, F. Martignon, **A Game Theoretic Framework for joint Routing and Pricing in Networks with Elastic Demands**, in Proceedings of the 4th International Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS 2009), October 2009, Pisa, Italy.
32. A. Capone, J. ELIAS, F. Martignon, **Optimal Design of Service Overlay Networks**, in Proceedings of the Fourth International Telecommunication Networking Workshop on QoS in Multiservice IP Networks, IT-NEWS 2008, Venice, Italy, February 2008.
33. J. ELIAS, F. Martignon, A. Capone, **An Efficient Dynamic Bandwidth Allocation Algorithm for Quality of Service Networks**, in Autonomic Networking 2006 (INTELLCOMM 2006), Paris, France, 27-29 September 2006, also published in Springer Lecture Notes in Computer Science Volume #4195, pp. 132-145 (acceptance rate: 25%) .
34. A. Capone, J. ELIAS, F. Martignon, G. Pujolle, **Dynamic Resource Allocation in Communication Networks**, in Networking 2006, Coimbra, Portugal, 15-19 May 2006, also published in Springer Lecture Notes in Computer Science, Volume #3976, pp. 892-903 (acceptance rate: 20%).
35. A. Capone, J. ELIAS, F. Martignon, G. Pujolle, **Dynamic Resource Allocation in Quality of Service Networks**, Springer Lecture Notes in Computer Science Volume #3883, pp. 184-19, 2006.

36. A. Capone, J. ELIAS, F. Martignon, G. Pujolle, **Distributed Dynamic Bandwidth Provisioning in Quality of Service Networks**, in Proceedings of the Third EuroNGI Workshop on QoS and Traffic Control, Ecole Normale Supérieure (ENS), Paris, France, 7-9 December 2005.
37. A. Capone, J. ELIAS, F. Martignon, G. Pujolle, **Dynamic Resource Allocation in Quality of Service Networks**, in the Second EuroNGI Workshop on New Trends in Network Architectures and Services, Villa Vigoni, Como, Italy, July 13-15 2005.

Under review (1)

J. ELIAS, F. Martignon, S. Paris, **Multi-Connectivity in 5G New Radio: Optimal Resource Allocation for Split Bearer and Data Duplication**, *under review* at IEEE Access, February 2022

National Peer-Reviewed Conferences (6)

1. Y. Al Najjar, S. Paris, J. ELIAS, J. Leguay, et W. Ben-Ameur, **Programmation dynamique pour l'optimisation du clustering des configurations réseau**, Saint Laurent de la Cabrerisse, Algotel 2019.
2. J. ELIAS, M. Mangili, F. Martignon, A. Capone, **Stochastic Optimization Models for Virtual Content Delivery Network Planning**, ROADEF 2016, February 11, 2016.
3. J. ELIAS, F. Martignon, G. Carello, **Very Large-Scale Neighborhood Search Algorithms for the Design of Service Overlay Networks**, Italian Networking Workshop, Cortina d'Ampezzo, Italy, January 2009.
4. J. ELIAS, F. Martignon, A. Capone, G. Pujolle, **Dynamic Bandwidth Allocation in Communication Networks**, Italian Networking Workshop, Bardonecchia, Italy, January 2007.
5. J. ELIAS, D. Gaïti, **Contrôle de MPLS par l'utilisation des Systèmes Multiagents**, DNAC-PARIS'04, Paris, France, November-December 2004.
6. J. ELIAS, D. Gaïti, G. Pujolle, **Optimisation du Protocole MPLS par l'utilisation des Systèmes Multiagents**, in Proceedings of 6èmes Journées Doctorales Informatique et Réseau (JDIR'04), Lannion, France Télécom R&D, France, 2-4 November 2004.

Spoken languages:

Italian: Fluent (Italian citizenship)

English: Fluent

French: Fluent

Arabic: Mother tongue

Data: 21 Marzo 2022

Luogo: Bologna