E. Veronica Belmega

Associate Professor (*Maître de Conférences, HDR*) at ENSEA
Deputy Director of ETIS laboratory

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		Email	belmega@ensea.fr
		Webpage	sites.google.com/site/evbelmega
Date of Birth	22^{nd} May 1983	**Civil Status**	Married, one child
Nationalities	Romanian and French		

Research Interests

Themes: online optimization, machine learning and game theory applied to energy-efficient communications, IoT networks, MIMO systems, wireless communications, physical layer security, electrical power grids, ...

Main contributions: optimal transmit (precoding) strategies maximizing the energy efficiency in MIMO systems, low-feedback online and efficient algorithms coping with arbitrary network dynamics and mobility (IoT networks)

Professional Experience

Sep 2011 - Present Associate Professor (*Maître de Conferénces*) - ENSEA,
Electrical engineering graduate school, Cergy-Pontoise, France
***Research**: ETIS, UMR 8051, CY Cergy Paris Université, ENSEA, CNRS*
***Teaching**: Computer Science Dept. and Signal Processing Dept.*

Sep 2015 - Aug 2017 Visiting Researcher (Délégation complète) - Inria, Grenoble Rhône-Alpes, France
***Collaborator:** Panayotis Mertikopoulos*

Oct 2010 - Aug 2011 Post-doctoral Researcher - Princeton University, NJ, USA, and Supélec, Gif-sur-Yvette, France
***Collaborators:** Vincent H. Poor, Lalitha Sankar, Walid Saad, Mérouane Debbah*

Sep 2007 - Aug 2010 Teaching Assistant (*Monitrice*) - École Polytechnique, Palaiseau, France
***Teaching:** Physics Dept.*

Education and Degrees

Mar 2019 HDR (Habilitation to Direct Research) - Université de Cergy-Pontoise, France
"Contributions to energy-efficient wireless communications exploiting games, online optimization and learning"

2007-2010 PhD in Telecommunications - Université Paris-Sud 11, Orsay, France
"On resource allocation problems in distributed MIMO wireless channels"
***Research:** L2S, UMR 8506, CNRS, CentraleSupélec, Université Paris-Saclay*
***Advisors:** Samson Lasaulce, Mérouane Debbah*

2006-2007 MSc in Signal Processing and Communications - Université Paris-Sud 11, Orsay, France
Rank: 1/13, *Mention TB - Trés Bien*

2005-2006 International Socrates/Erasmus Exchange Program - École Polytechniques, Palaiseau, France
***Track:** Applied Mathematics (3rd year, French engineer cycle)*

2002-2007 Engineer Diploma in Automatic Control and Computer Science - Politehnica University of Bucharest, Romania
***Rank:** 6/210*

Awards and Distinctions

2021 **Prix CY Alliance**: Women and Science award
2020 IEEE Senior Member
2020 PR certification (*qualification*)- CNU 61
2018 Doctoral Supervision and Research Bonus (PEDR) - French National Council of Universities (CNU 61)
2017 Top Editors - Transactions on Emerging Telecommunications Technologies (ETT)
2015 Fellowship for Mobility (*Délégation*) - Inria, France
2012 Associate Research Scholar Fellowship - Princeton University, NJ, USA
2009 **Prix L'Oréal**: National Fellowship - L'Oréal France - UNESCO - French Academy of Science
2007 PhD Fellowship - French Ministry of Research and Education
2005 Socrates/Erasmus International Scolarship - École Polytechnique and Politehnica University of Bucharest

Advising

PhDs 3 ongoing (30% and 60% - official director, and 20% - co-advisor), 3 defended (40%, 50%, 75% - co-advisor) and one starting in the fall 2021
Post-docs 2

Publications

27 (20*) International journal papers, **3 (2*)** invited
51 (40*) International conference papers, **13 (6*)** invited
4 (1*) Book chapters
6 (3*) National conference papers
* Publication of research work post-PhD

Scientific Responsibilities

2020 - present ETIS, UMR 8051, CY Cergy Paris University, ENSEA, CNRS
Deputy Director (Directrice Adjointe)

2019 - 2023 International ANR - FAPESP research project: ELIOT - Emerging Technologies in IoT
Principal Investigator (PI)

2016 - 2018 Signal-Image-Vision Best PhD prize organized jointly by the French Club EEA, GdR ISIS and GRETSI
Jury member, Vice-president in 2017 and President in 2018

Jan. 2013 - Nov. 2017 GdR ISIS French Network in Image, Signal and Vision funded by the CNRS and French industrial partners
Scientific coordinator (Directrice scientifique adjointe)

2016 - present PhD and Associate Prof. hiring committees
PhD examiner: 8; PhD reviewer (rapporteure): 4; Associate Prof. hiring committees: 5

Local Responsibilities (ENSEA)

Since 2020 Int. Relations correspondent of the "Radulet" area (Czech Rep., Bulgaria, Romania, Greece, Turkey)

Since 2019 Head of the Master of Eng. in Computer Science (*Option IS - Informatique et Systèmes, 3ème année*)

2014, 2018 Co-head of the Master of Eng. in Networks and Communications (*Option RT - Réseaux et Télécoms., 3ème année*)

2013-2016 Member of the Scientific Board

Editorial Activities

Jul. 2016 - Feb. 2020 Transactions on Emerging Telecommunications Technologies (ETT)
Executive Editor

Feb. 2017 - Oct. 2017 IET Signal Processing
Associate Editor

Conference Organization and TPCs

2020 Special session: *"Recent advances in the applications of game theory and learning to communication networks"*, **NETGCOOP**, Cargese, Corsica

2017 **GdR ISIS meeting**: *"Game theory, optimization and learning"*, Paris, France

2014 International workshop: *"Wireless Networks, Communication, Cooperation and Competition" (WNC3)*, **WiOpt**, Hammamet, Tunisia

2013 Special session: "*Communications and Control in the Smart Grid" (CCSG)*, **IEEE BlackSeaCom**, Batumi, Georgia

Since 2011 Regular **TPC**: IEEE confs. ICC, GLOBECOM, WCNC, ICNC, SPAWC, etc.

1 Research activities

1.1 Summary and main research interests

Since Sep. 2011, my research activities as Associate Professor (*Maître de Conférences*) have been performed mainly at ETIS Laboratory (*Équipes Traitement de l'Information et Systémes*), UMR 8051, CY Cergy Paris University, ENSEA, CNRS, Cergy-Pontoise, France within the communications research group: ICI – *Information, Communication, Imagerie*. During Sep. 2015 - Aug. 2017, I have been a full-time Visiting Researcher (*délégation complète*) at Inria Grenoble Rhône-Alpes, France. During this period, I have been associated with two research groups: first with MESCAL (Sep. 2015-Dec. 2015) and then with POLARIS (Jan. 2016-Aug. 2017), which are joint Inria-CNRS project teams and are, hence, also affiliated to LIG (*Laboratoire d'Informatique de Grenoble*), UMR 5217, Grenoble, France.

My research activities below have brought two novel research axes to ETIS and more specifically to the ICI team: *game theory for self-optimizing networks* and *no-regret and online optimization for mobile networks*, both of which have been consolidated by the arrival of Maël le Treust (CR CNRS) and Marwa Chafii (MCF ENSEA, Chaire AI). Moreover, my collaboration with Arsenia Chorti (Univ. of Essex, UK until 2017 and MCF ENSEA since 2017) has allowed the reinforcement of the existing research axis on *physical layer security* in ETIS, as she has joined our team since Sep. 2017.

My research interests focus on, but are not limited to, investigating (decision-wise) distributed communication networks composed of intelligent and autonomous nodes (e.g., IoT networks), which potentially may vary in a non-stationary and unpredictable way. The necessary tools to study the interactions between these nodes and the outcomes or network operating points are pluridisciplinary and range from: **game theory**, **convex optimization** and **online optimization** to **machine learning**. The applications I have been investigating stem from: resource optimization problems (spectrum, power, space, time) efficient in terms of rate, power or energy consumption, physical layer security, service pricing problems, security and privacy issues in the smart grid, etc..

During my PhD, which was performed in L2S (*Laboratoire des Signaux et Systèmes*) laboratory, UMR 8506, CNRS, CentraleSupélec, Université Paris-Saclay, Gif-sur-Yvette, France under the joint supervision of Samson Lasaulce (CNRS) and Mérouane Debbah (CentraleSupélec, Huawei Paris), my research was focused on multiple-antenna (MIMO) wireless networks composed of either a single or multiple transmitters communicating to a common receiver (i.e., MAC - multiple access channels). The transmitters were driven by rate maximization individual objectives, in most of the investigated settings, or by energy efficiency maximization. Such problems required the use of convex optimization and non-cooperative games and the developed algorithms leading to the respective (optimal or Nash equilibrium) solutions were based on iterative best-response (leading to iterative water-filling type of) algorithms. Since then, both the range of applications and the range of the exploited theoretical tools have been diversified.

More precisely, since my post-doc, which took place jointly between Princeton University and Supélec in collaboration with Prof. Vincent H. Poor and Prof. Mérouane Debbah, I have been interested in the following issues and applications.

- *AI-enabled communications: online optimization, reinforcement and no-regret learning, and deep learning for mobile networks*

  Publications: 5 journals [J25], [J24], [J21], [J16], [J11], 10 conf. [C49], [C44], [C43], [C39], [C38],[C33], [C31], [C30], [C27], [C21]
  Collaborators: Mérouane Debbah (Huawei Paris), Panayotis Mertikopoulos (CNRS), Inbar Fijalkow (ENSEA), Walid Saad (VirginiaTech) Anne Savard (IMT Lille), Romain Negrel (ESIEE Paris)
  Students: Yacine Ben Atia (PhD), Irched Chafaa (PhD), Alexandre Marcastel (PhD), Kimon Antonakopoulos (PhD), Hajar El Hassani (PhD)
  Supported by: ANR-PRCI-ELIOT, Inria, Chair Orange IoT, ANR-JCJC-ORACLESS, PEPS CNRS-INS2I JCJC, ENSEA, GdR ISIS, CentraleSupélec, ENSEA, IRCICA

- *Resource optimization in energy-efficient communications exploiting optimization and game theory*

Publications: 7 journals [J23], [J22], [J18], [J17], [J13], [J12], [J8], 18 conf. [C51], [C48-C45], [C42], [C37], [C36], [C32], [C29], [C28], [C25-C22], [C18], [C16], [C12] et 3 conf. nat. [CF6-CF4]
Collaborators: Inbar Fijalkow (ENSEA), Panayotis Mertikopoulos (CNRS), Giacomo Bacci (Univ. of Pisa, MBI srl), Luca Sanguinetti (Univ. of Pisa), Anne Savard (IMT-Lille), Romain Negrel (ESIEE), Noura Sellami (Univ. of Sfax)
Students: Olivier Bilenne (Post-doc), Kimon Antonakopoulos (PhD), Raouia Masmoudi (PhD), Antonia M. Masucci (Post-doc), Hajar El Hassani (PhD), Vineeth Varma (PhD), Chao Zhang (PhD)
Supported by: ANR-PRCI-ELIOT, Inria, ANR-JCJC-ORACLESS, PEPS CNRS-INS2I JCJC, NEWCOM#, ENSEA, IR-CICA, FUI Systematic EconHome, L'Oréal France

- *Security and privacy issues in wireless networks and smart grids*

  Publications: 5 journals [J27], [J26], [J20], [J19], [J14] and 6 conf. [C41], [C40], [C35], [C34], [C19], [C15]
  Collaborator: Subhash Lakshminarayana (University of Warwick), Vincent H. Poor (Princeton University), Arsenia Chorti (Univ. of Essex, ENSEA), Lalitha Sankar (Arizona State University)
  Students: Gada Rezgui (MSc), Miroslav Mitev (PhD)
  Supported by: EUTOPIA, Inria, ENSEA, Princeton University, Supélec, CY Cergy Paris University Paris Seine

- *Service pricing techniques in multi-tier heterogeneous networks*

  Publications: 1 journal [J10] and 2 conf. [C17], [C13]
  Collaborators: Walid Saad (VirginiaTech) and Mérouane Debbah (CentraleSupélec, Huawei Paris)
  Students: Camilla M. G. Gussen (MSc), Luca Rose (PhD)
  Supported by: Supélec and Princeton University

- *Rate adaptation protocols for video transmission conciliating QoS and user quality of experience (QoE)*

  Publications: 1 journal [J15], 1 conf. [C26]
  Collaborator: Ángeles Vasquez-Castro (Universitat Autonoma de Barcelona)
  Student: Smrati Gupta (PhD)
  Supported by: Universitat Autonoma de Barcelona

- *Hawks and Doves game in a dynamic framework*

  Publications: 1 journal [J9], 1 conf. [C14]
  Collaborators: Eitan Altman (Inria), Yezekayel Hayel (Univ. d'Avignon)
  Supported by: L'Oréal France.

Most of these issues require to exploit mathematical tools going beyond classic convex optimization and non-cooperative games:

a) *no-regret learning and online optimization* are powerful tools to tackle the arbitrary and unpredictable dynamics of highly varying networks (IoT, 6G) [J21], [J16], [J11];

b) *exponential learning algorithms* – inspired from *machine learning (reinforcement learning, multi-armed bandits)* and *mirror descent* – allow to converge to the Nash equilibrium solution in static multi-user settings in which the more common iterative water-filling may fail to converge [J16], [J8]

c) *multi-armed bandits* are particularly relevant for the beam-alignment problem in multi-antenna mmWave networks [J24] as well as for enabling NOMA with no CSIT/CDIT [J25];

d) ongoing work and collaborations are also focused on data-driven approaches based on *deep learning* [C49].

1.2 Advising

My overall student advising activities since Sep. 2011 (including the official advising percentages) can be summarized as follows:

- **7 PhD students**: 3 ongoing (2 as official director (30%, 60%) and one as co-advisor (20%)), 3 defended (40%, 50%, 75% as co-advisor) and one to start in the fall 2021
- **3 M2R students**
- **2 Post-docs**

Complete details are provided in Table 1 concerning the PhD students and Table 2 concerning the MSc students and post-docs.

PhD student	Perc.	Subject	Period	Publications	Funding	Co-advisors
Amin Nassaj	50% (off. co-dir.)	Intelligent cyber-physical power systems exploiting deep reinforcement learning	Oct. 2021 - Sep. 2025	-	EUTOPIA PhD cofund WALL-EE	Subhash Lakshminarayana (Univ. of Warwick, UK, 50%, off. co-dir)
Yacine Ben Atia	30% (off. dir.)	Cooperation, Optimization and AI for future communications	Oct. 2020 - Sep. 2023	-	ED EM2PSI CY & IMT Lille Douai	Anne Savard (IMT Lille Douai, 40%), Romain Negrel (ESIEE Paris, 30%)
Hajar El Hassani	60% (off. dir.)	Energy-efficient IoT networks	Oct. 2019 - Mar. 2023 (+ 6 months COVID)	[J25], [C51], [C50], [C47]	ANR ELIOT	Anne Savard (IMT Lille Douai, 40%)
Kimon Antonakopoulos	20%	Learning algorithms for online variational inequalities	Nov. 2017 - Apr. 2021 (+ 6 months)	[C48], [C43], [C42]	Inria fellowship and ANR ORACLESS	Panayotis Mertikopoulos (CNRS, 80 %, off. dir.)

PhD alumni	Perc.	Subject	Period	Publications	Funding	Co-advisors
Irched Chafaa	75%	mmWave beam alignment via machine learning	Nov. 2017 - Jun. 2021 (+ 8 months COVID), Defense: Sep. 7th, 2021	[J28sub], [J24], [C49], [C44], [C38]	Algerian state fellowship	Mérouane Debbah (CentraleSupélec, Huawei Paris, 25%, off. dir.)
Alexandre Marcastel (Teacher and trainer, CESI, Angoulême, France)	40%	Online optimization and learning for IoT networks	Oct. 2015 - Feb. 2019, Defense: Feb. 21st, 2019	[J21], [C39], [C33], [C31], [C30]	Orange IoT Chair at UCP, 2015-2018, ATER ENSEA 2018-2019	Panayotis Mertikopoulos (CNRS, 30%) and Inbar Fijalkow (ENSEA, 30%, off. dir.)
Raouia Masmoudi (Research Eng., SafranTech, Paris Saclay)	50%	Home automation communications systems efficient in terms of energy consumption	Oct. 2011 - Jul. 2015, Defense: Dec. 1st, 2015	[J17], [C36], [C29], [C25], [CF5]	FUI Systematic EconHome 2011-2013, ATER ENSEA 2013-2015	Inbar Fijalkow (ENSEA, 50%, off. dir.)

Table 1: Advising ongoing and defended PhD students

MSc/MEng student	Master	Perc.	Subject	Period	Publications	Co-advisors
Jérémy Gatineau	ENSEA (MEng)	30%	Emergent communication and reasoning	6 months in 2021	[J20]	Marwa Chafii (ENSEA, 30%) and Walid Saad (VirginiaTech, 40%)
Gada Rezgui (PhD student at ETIS)	M2R SIC (MSc)	50%	Energy harvesting as a means to mitigate jamming attacks; a game theoretic analysis	6 months in 2017, Defense: Sep. 14th, 2017	[J20]	Ersi Chorti (Univ. of Essex, 50%)
Alexandre Marcastel (Teacher and trainer, CESI, Angoulême, France)	M2R SIC (MSc)	100%	Energy-efficient resource allocation policies in cognitive radio systems	6 months in 2015, Defense: Sep. 24th, 2015	-	-
Camilla M. G. Gussen (Post-doc, IMT Atlantique, Brest, France)	Univ. Federal Rio de Janeiro, Brazil (MSc)	70%	Pricing and bandwidth allocation problems in wireless multi-tier networks	4 months in 2011	[C13]	Mérouane Debbah (CentraleSupélec, Huawei Paris, 30%)

Post-doc	Subject	Period	Publications	Funding	Collaborators
Olivier Bilenne (Post-doc at Maastricht Univ., Netherlands)	Adaptive optimization algorithms for massive MIMO systems	Sep. 2018 - May 2020	[J23], [C45]	ANR ORACLESS	Panayotis Mertikopoulos (CNRS)
Antonia M. Masucci (Research Eng., Orange, Paris area, France)	Subcarrier allocation policies in SC-FDMA systems	Sep. 2011 - Aug. 2013	[J12], [C20], [CF4]	ATER ENSEA	Inbar Fijalkow (ENSEA)

Table 2: Advising MSc/MEng students and post-docs

Collaborations involving PhD students

Throughout my different collaborations, I have worked closely with the PhD students below without being officially involved in their advising, but which have lead to several publications: Miroslav Mitev (University of Essex, UK) [C40]; Chao Zhang (CentraleSupélec) [C28]; Smrati Gupta (UAB, Spain) [J15], [C26]; Luca Rose (CentraleSupélec) [J10], [C17]; Vineeth Varma (CentraleSupélec) [BC4].

Other advising activities

- 8 MSc students, M2R SIC, ENSEA and University of Cergy-Pontoise, 3 months each (between January and March)
- 3 ENSEA students (M1 level) and one student from the Université de Cergy-Pontoise (L3 level)

1.3 Research projects

I am **Principal Investigator** of the French-Brazilian ANR PRCI ELIOT project (390k euro for ENSEA). Also, I have lead as **Principal Investigator** several local projects funded by ENSEA (an overall amount of 12k euro) since 2013.

- **EUTOPIA PhD cofund WALL-EE** - Wide-area Adaptive control in InteLLigent cyber-physical power systems exploiting dEEP reinforcement learning, **2021-2025**, 71k £
  Role: **Co-Investigator**
  Participants: ENSEA (Host), University of Warwick (Home), Princeton University
  Collaborators: Subhash Lakshminarayana (Co-I, Univ. of Warwick), H. Vincent Poor (Princeton Univ.)
  PhD funding of Amin Nassaj (Univ. of Warwick, ETIS)
- **ANR PRCI ELIOT** - Enabling Technologies for IoT, **Apr. 2019 - Oct. 2023, 390k euro for ENSEA**
  Role: **Principal Investigator**
  International collaboration: ANR-FAPESP (France-Brazil)
  Participants: ENSEA, University of São Paulo (USP), and Pontifical Catholic University of Rio de Janeiro (PUC-Rio)
  Collaborators: Vitor Nascimento and Cintia Borges Margi (PIs, USP, Brazil), Rodrigo C. de Lamare (PI, PUC-Rio, Brazil), Arsenia Chorti (ENSEA), Jordane Lorandel (CY Cergy Paris Univ.), Iryna Andriyanova (CY Cergy Paris Univ.), Inbar Fijalkow (ENSEA), ...
  PhD funding of Hajar El Hassani (ETIS), mobility funds, etc, 120k euro
- **Since 2013**, 8 local BQR-SRV projects in ENSEA and one Paris Seine project, **overall 14k euro**
  Role: **Principal Investigator**
  Invited Professors: Subhash Lakshminarayana (University of Warwick, UK in 2019 and 2021), Arsenia Chorti (University of Essex, UK, in 2017 and 2016), Zhu Han (University of Houston, USA, 2014)

Since 2011, I have participated as **Project Member** to the following research projects:

- **POTIONS** - cooPeration, Optimization and arTificial Intelligence for future communicatiONs: interplay between model-based and data-driven approacheS, Oct. 2021 - Sep. 2023
  Collaborators : Anne Savard (PI, IMT Lille Douai), Romain Negrel (ESIEE Paris)
  PhD co-funding from IMT Lille Douai and CY Cergy Paris Univ. (ED EM 2PSI): Yacine Ben Atia (ETIS, IMT Lille Douai), 93k euro

- **AIRONMAN** - AI enabled resource allocation in mmWave networks, Nov. 2019 - Sep. 2020, 4k euro
  Collaborators: Walid Saad (VirginiaTech), Mehdi Bennis (Univ. of Oulu), Mérouane Debbah (Huawei Paris) and Irched Chafaa (ETIS)
  GdR ISIS and ENSEA joint mobility funding of PhD Irched Chafaa (ETIS) still pending because of COVID19

- **Chair Orange IoT** at the University of Cergy-Pontoise Foundation, Oct. 2015 - Sep. 2018, 200k euro
  Collaborators: Inbar Fijalkow (head of the Chair, ENSEA), Jean Schwoerer (Orange) and Alexandre Marcastel (ETIS)
  PhD funding of Alexandre Marcastel (ETIS), 105k euro

- **COST GAMENET** - European Network of Game Theory, CA16228, Oct. 2017 - Sep. 2021
  Collaborators: Mathias Staudigl (Action chair, Maastricht University), Panayotis Mertikopoulos (CNRS)

- **ANR-JCJC-ORACLESS** - Online resource allocation for unpredictable large-scale wireless systems, Oct. 2016 - Sep. 2021, 207k euro
  Collaborators: Panayotis Mertikopoulos (PI, CNRS), Samson Lasaulce (CNRS)
  Post-doc funding of Olivier Bilenne (LIG), 130k euro

- **PEPS CNRS-INS2I JCJC** - Resource allocation in dynamic network environments via adaptive learning (REAL.net), Jan. 2016 - Dec. 2016, 12.5k euro
  Collaborators: Panayotis Mertikopoulos (PI, CNRS), Alexandre Marcastel (ETIS)

- **ICT NEWCOM #** - Network of Excellence in Wireless Communications, Nov. 2012 - Oct. 2015, funded by the European Commission FP7-ICT-318306
  Participants: CNIT, CNRS, Eurecom, CTTC, Aalborg Universitet, Bilkent Universitesi, IASA, INON, Technion Tel Aviv, Technische Universitaet Dresden, University of Cambridge, Université Catholique de Louvain, Oulun Yliopisto, Technische Universitaet Wien
  Collaborators: Luca Sanguinetti (University of Pisa), Giacomo Bacci (University of Pisa), Panayotis Mertikopoulos (CNRS)

- **FUI Systematic EconHome** - Eco Conception du Home Network, Avr. 2010 - Oct. 2012
  Participants: CEA Grenoble, Docea Power, France Telecom, Orange, Inria Lyon, STMicroelectronics
  PhD funding of Raouia Masmoudi (ETIS) during 2011-2013, 65k euro

1.4 Collaborations

International collaborations

- **Vincent H. Poor**, Princeton University, USA
- **Subhash Lakshminarayana**, University of Warwick, UK
- **Walid Saad**, VirginiaTech, USA
- **Arsenia Chorti**, University of Essex, UK (until Sep. 2017)
- **Luca Sanguinetti** and **Giacomo Bacci**, University of Pisa, Italy
- **Lalitha Sankar**, Arizona State University, USA
- **Ángeles Vasquez-Castro**, Universitat Autonoma de Barcelona (UAB), Spain
- **Noura Sellami**, University of Sfax, Tunisia
- **Aris Moustakas**, National and Kapodistrian University of Athens, Greece
- **Rodrigo C. De Lamare**, PUC-Rio, Brazil
- **Vitor Nascimento**, USP, Brazil

National collaborations

- **Panayotis Mertikopoulos**, LIG, CNRS, Grenoble
- **Mérouane Debbah**, Huawei, Paris
- **Samson Lasaulce**, L2S, CNRS, Gif-sur-Yvette
- **Romain Negrel**, ESIEE Paris, Noisy-Champs
- **Anne Savard**, IMT Lille Douai
- **Eitan Altman**, Inria, Avignon
- **Yezekayel Hayel**, Université d'Avignon

Local collaborations

- **Inbar Fijalkow**, ENSEA
- **Arsenia Chorti**, ENSEA (since Sep. 2017)
- **Iryna Andriyanova**, Université de Cergy-Pontoise
- **Marwa Chaffii**, ENSEA

1.5 Visiting appointments

- Inria Grenoble Rhône-Alpes, LIG, **France**
  Duration: two years (*délégation*) 2015-2017, one week in 2014, one week in 2013
- Universitat Autonoma de Barcelona, **Spain**
  Duration: one week in 2013, two weeks in 2009
- Princeton University, New Jersey, **USA**
  Duration: one month in 2012, post-doc in 2011
- National and Kapodistrian University of Athens, **Greece**
  Duration: six weeks in 2010
- Université d'Avignon, **France**
  Duration: two weeks in 2010
- UNIK, University of Oslo, **Norway**
  Duration: one week in 2009, one week in 2008

1.6 Awards and distinctions

Post-PhD

2021	**Prix CY Alliance**: Women and Science award
2020	**IEEE Senior Member** grade elevation
2020	PR certification (*qualification*) - CNU 61
2018-2022	Doctoral Supervision and Research Bonus - **PEDR** from the French National Council of Universities CNU 61
2017	Among the **Top Editors** for outstanding contributions to Transactions on Emerging Telecommunications Technologies (ETT) during the period 2016-2017
2015-2017	**Inria Fellowship for Mobility** granting two research-dedicated years from Inria, France
2012	**Associate Research Scholar** fellowship from Princeton University, USA funding a one month visit in 2012

Before and during the PhD

2009	**Prix L'Oréal**: **L'Oréal France-UNESCO-French Academy of Science** national fellowship "For young women doctoral candidates in science" (one of the ten laureates), France
2007-2010	French Ministry of Research and Education PhD fellowship awarded based on scientific excellence and academic records
2005	Socrates/Erasmus international exchange scholarship École Polytechnique, France and Politehnica University of Bucharest, Romania

1.7 Bibliometry

The complete publication list is detailed in section 5.
Indicators: **1463 citations, h-index: 21, i10-index: 37** (source *Google Scholar*, Aug. 19th, 2021).

- Journals: 27 (20 post-PhD) of which 3 (2 post-PhD) invited
- Conferences: 51 (40 post-PhD) of which 13 (6 post-PhD) invited
- Book chapters: 4 (1 post-PhD)
- National conferences: 6 (3 post-PhD)
- Google Scholar webpage:
  https://scholar.google.fr/citations?user=ODy3eccAAAAJ&hl=fr
- HAL webpage (IdHAL elena-veronica-belmega):
  https://cv.archives-ouvertes.fr/elena-veronica-belmega
- ResearchGate webpage:
  https://www.researchgate.net/profile/E_Veronica_Belmega
- ORCID: 0000-0003-4336-4704
- DBLP webpage:
  https://dblp.uni-trier.de/pers/hd/b/Belmega:Elena_Veronica

2 Teaching activities

2.1 Overview

My teaching activities at ENSEA are pluridisciplinary and lie at the interface between two departments: the *Computer Science* Dept. and the *Signal Processing* Dept.

In between Sep. 2015 – Aug. 2017, was granted a mobility leave (*délégation à temps complet*) from Inria Grenoble Rhône-Alpes. As a result and given my mobility to Grenoble, France, I was relieved from all teaching duties from ENSEA for two full years.

From Apr. 2019 – Jul. 2019, I was away on maternity leave.

Tables 3, 4 and 5 below offer a concise summary of my teaching activities in terms of: taught modules; amount of hours (*équivalent TD*); student levels (all levels of the French engineering cycle and the local M2R); type (CM - *cours magistral*, TD - *travaux dirigés*, TP - *travaux pratiques et projets*). The "Other" category represents the equivalent number of hours granted in exchange of various administrative or module responsibilities, student projects, internships, maternity leave, etc.

Dept.	Subject	Level	Type	Nb. h	Perc.
Comp. Science 49.1%	Master of Engineering responsibilities	-	-	144	8.2%
	Algorithms	M2	CM, TD, TP (PLT)	289	16.4%
	C++ Object Oriented Prog.	M1	CM, TP	96	5.4%
	JAVA Prog.	M1	TP	84	4.8%
	Data structures	L3	TP	72	4.1%
	Computer science (C prog.)	L3	TD, TP	156	8.9%
	Microprocessors	L3	TP	24	1.3%
Sig. Processing 40.4%	Advanced Digital Commun.	M2	CM, TD, TP	206	11.7%
	Cvx. Optim., Game Theory & Applic.	M1	CM, TP	90	5.1%
	Intro. to Game Theory	M2	CM	14	0.8%
	Commun. Sys.	M2	CM, TD	96	5.4%
	Intro. to Digital Commun.	M1	CM, TD, TP	202	11.4%
	Digital Signal Processing	M1	TD, TP	104	5.9%
	Other			183	10.4%

Table 3: Modules taught at ENSEA during 2011–2020 in nb. hours (*équivalent TD*).

Year	CM	TD	TP	Other	Total
2011 - 2012	12	6	194	8	220
2012 - 2013	60	23	132	7	222
2013 - 2014	81	23	130	18	252
2014 - 2015	77	22	56	51	206
2017 - 2018	45	34	108	37	224
2018 - 2019	36	46	92	46	220
2019 - 2020	36	32	40	96	204
2020 - 2021	48	36	64	64	212
Total	395	222	816	327	1760
Percentage	22.4%	12.6%	46.3%	18.5%	100%

Table 4: Teaching at ENSEA during 2011–2020 in nb. hours (*équivalent TD*)

Year	New classes	Perc. out of 192 h
2011 - 2012	212	108.2%
2012 - 2013	59	30.1%
2013 - 2014	45	23%
2014 - 2015	0	0%
2017 - 2018	60	30.6%
2018 - 2019	20	10.2%
2019 -2020	0	0%
2020 - 2021	36	18.3%

Table 5: Teaching dynamics: new classes in nb. hours (*nombre d'heures équivalent TD*). In 2015-2017, I was on mobility leave (*délégation à temps complet*) at Inria Grenoble.

2.2 Taught modules

• *Algorithms (M2 ENSEA, CM, TD, PLT described in Sec. 2.4):* data structures (heaps, binary search trees, B-trees, queues, stacks, associative arrays, etc.), memory and computation complexity, recursive vs. iterative procedures, algorithms: Huffman coding, minimum path (Dijkstra, Ford, ...), maximum flow (Ford-Fulkerson), AI algorithms (A*, minimax decision tree, alpha-beta pruning), etc.

• *JAVA programming (M1 ENSEA, TP):* basics of object oriented programming, classes, instances, references, encapsulation, accessibility, inheritance, polymorphism, error handling, exceptions, graphical user interface, event management, object oriented design.

• *Data structures (L3 ENSEA, TP):* basic data structures (tables, lists, stacks, queues, and heaps), simple algorithms (bubble sort, insertion sort, quick sort,...).

• *Computer science (C programming, L3 ENSEA, TD, TP):* software and hardware components of a computer (vonNeumann architecture), development of simple algorithms, C language and programming, library design, pointers and memory management in C.

• *Digital Signal Processing (M1 ENSEA, TD, TP):* frequency content of a signal, SNR, effect of filters (linear phase, phase shifter,...) on the spectrum, design the transfer function of a filter to extract the useful signal, or attenuate unwanted components, implement the designed filter, etc.

• *Microprocessors (L3 ENSEA, TP):* sequential logic, microprocessors, procedural programming, programming of microprocessor-based systems.

2.3 New modules

Aside from teaching the following modules (CM,TD,TP), this section summarizes the ones that I have either introduced or significantly changed at ENSEA.

The three modules that I have proposed and prepared from scratch are the following.

• *Convex Optimization, Game Theory and Applications (M1 ENSEA, lecture slides, exercices, TP MatLab & CVX package):* convex optimization, descent algorithms (gradient descent, Newton) applied to speech de-noising, classical water-filling algorithm, non-cooperative games, multi-user iterative water-filling algorithm.

• *Intro. to Game Theory (M2R SIC at the University of Cergy-Pontoise, lecture slides, CM):* discrete non-cooperative games (prisoner's dilemma, head-tails, etc.), Nash equilibrium, Pareto optimality, von Neumann indifference principle, continuous non-cooperative games, power allocation problem in a distributed multi-user channel.

• *Intro. to Digital Commun. (M1 ENSEA, lecture slides, exercices, Amphi, TD, TP MatLab):* analog vs. digital communications, base-band and band-pass communication, basic communication chain, modulation types, inter-symbol interference and Nyquist conditions, adaptive filter, detection, **also taught in English since 2020**.

The three modules that, although existed, I have significantly changed are listed below.

• *Intro. to C++ Object Oriented Prog. (M1 ENSEA, lecture slides, exercices, TD* machine*):* encapsulation (classes, objects), inheritance, polymorphism, pointers and references, function and operator overloading, access specifiers.

• *Advanced Digital Commun. (M2 ENSEA & M2R CY Cergy Paris Univ., lecture slides, exercices, CM, TD, TP MatLab):* high data rate communications, wireless multi-path channel model, equalization, multi-carrier communications OFDM, **taught in English since 2018**.

• *Communication Systems (M2 ENSEA, lecture notes, exercices, CM, TD):* multi-access schemes, OFDMA, SC-FDMA, multi-antenna systems MIMO, spatial diversity, space-time coding (Alamouti).

2.4 Innovative pedagogy: pluridisciplinary software project

The *Projet Logiciel Transverse* (PLT) was initiated in Sep. 2017 by my colleagues Philippe Henri-Gosselin (ENSEA until 2018) and David Picard (ENSEA until 2019) in the **Master of Eng. of Computer Science**, which I lead since Sep. 2019. The PLT pools together the TP ressources of four different modules: *Software Engineering, Parallel Computing, Algorithms and Web Service*, together

into an ambitious (~ 120h TP) and pluridisciplinary software project. The main objective is to break away from the classical CM-TD-TP model and to prepare the students to their potential software engineering careers.

The project is essentially the development of a video game (turn-based strategy game, roguelike) in C++ programming from scratch, which aims at obtaining a finished product: a working demo. This way the students are able to explore the intricate links between the four modules, to explore and exploit relevant software developing tools and environments (e.g., CMake, Dia, gitHub versionning, SFML library for user interface, unit coverage, technical reports, etc.), to manage their work with their pairs in order to meet a strict working plan (both intermediary and major deadlines of deliverables – source codes and technical reports – are predefined). The major deliverables correspond to: game design and state definition, graphical interface and game engine, AI, web service (multi-players).

I have been involved in the PLT since Sep. 2019 as part of the teaching team, in charge of 24h of TP on *Artificial Intelligence* (i.e., the third major deliverable) associated to the *Algorithms* module I teach. Typically the students have to program a minimax decision tree (and the alpha-beta pruning algorithm) and test it against a simple heuristic and random choice. Each professor in the teaching team, myself included, has to evaluate and provide feedback over the entire project (minor and major deliverables) to part of the project pairs (equally divided among the professors).

As head of the **Master of Eng. of Computer Science**, and in collaboration with my colleague Christophe Bares (ENSEA, responsible for the PLT), since Sep. 2020, we have introduced several innovations to improve the PLT experience for the students but also for the teaching team (reducing the work-load on both sides and enhancing the team work):

- larger **project groups** of four students with a defined team leader (instead of pairs);
- **team advisors** (a professor is assigned to each project group to oversee the work management);
- intermediary deliverable **correction by peers** (each group of students is in charge of evaluating a different project and sending their feedback);
- round-Robin evaluations for the four major deliverables (each project is evaluated by four different professors as opposed to the same one).

2.5 Module responsibilities

I have been in charge of organizing the following modules at ENSEA. This involved: proposing the exam sheets, grading, updating the contents of the modules (CM, TD, TP), etc.

- Convex Optimization, Game Theory and Applications
- Algorithms
- C++ Object Oriented Programming
- Introduction to Digital Communication
- Advanced Digital Communications
- Communication Systems

3 Scientific, pedagogic and administrative responsibilities

3.1 Scientific responsibilities

ETIS Laboratory, UMR 8051

- Since Jan. 2020, I serve as Deputy Director
  - Assisting the Director of ETIS, Olivier Romain (CY Cergy Paris Univ.), in his representative missions; replacing the Director in day-to-day missions in his absence; *délégation de signature*; participate at the strategic and scientific discussions and decisions as a

member of the Steering committee (*Conseil de pilotage*) and of the Scientific board (*Conseil scientifique du laboratoire*) regarding the budget allocation, research and organization projects, PhD scholarships, etc.

Editorial activities

- During Jul. 2016 - Feb. 2020, I have served as **Executive Editor** for the *Transactions on Emerging Telecommunications Technologies (ETT)*

  Among the Top Editors for outstanding contributions to ETT during the period 2016-2017

- During Feb. 2017 - Oct. 2017, I have served as **Associate Editor** for the *IET Signal Processing* journal.

Conference organization

- ELIOT Student Webinars: to enhance multi-partner collaborations within the ANR PRCI ELIOT project, twice a month since Jan. **2021**
  `https://eliot.ensea.fr`

- Special Session: "Recent advances in the applications of game theory and learning to communication networks" at NETGCOOP 2020, Cargese, Corsica, Mar. **2020**

- GdR ISIS meeting: "Game Theory, Optimisation and Learning: Interplay and Applications to Signal Processing", Paris, France, **2017**
  Co-organized jointly with Samson Lasaulce (CNRS)
  `http://www.gdr-isis.fr/index.php?page=reunion&idreunion=346`

- WNC3 workshop: "International Workshop on Wireless Networks: Communication, Cooperation and Competition" (in conjunction with WiOpt), Hammamet, Tunisia, **2014**
  Co-organized and chaired jointly with Samson Lasaulce (CNRS)
  `http://2014wnc3.ensea.fr`

- Invited Session: "Communications and Control in the Smart Grid (CCSG)" at IEEE BlackSeaComm, Batumi, Georgia, **2013**
  Co-organized jointly with Lalitha Sankar (Arizona State University, USA) and David Gregoratti (CTTC, Spain)

- Session Chair: WCNC (Paris, France) 2012, WNC3 (Hammamet, Tunisia) 2014, GRETSI (Lyon, France) 2015

Research project expert

- FAPESP, Brazil: 2021

- ANR: 2013, 2017

- ERC: 2016 (starting grant)

National responsibilities

- Jan. 2016 - Dec. 2018, member of the jury of the **Best PhD Prize** in Signal, Image and Computer Vision awarded jointly by the French Club EEA, the GdR ISIS and GRETSI
  - **Vice-president** of the jury in 2017
  - **President** of the jury in 2018

- Jan. 2013 - Nov. 2017, **Scientific coordinator (*Directrice Scientifique Adjointe*)** of the GdR ISIS, a research group supported by CNRS and industrial partners

  Involved supervising the organization of 4-5 scientific *GdR ISIS meetings* per year jointly with Mérouane Debbah (CentraleSupélec, Huawei Paris, 2013-2014) and Mari Kobayashi (CentraleSupélec, 2015-2017)

  Theme D - Telecommunications: compression, protection, transmission, Axis 2 - Information and communication: from theory to practice

- PhD committees (4 reviewer, 8 examiner)
  - Apr. 12th, 2021 - Aymen Askri, Télécom ParisTech **(Reviewer- Rapporteure)**
  - Nov. 4th, 2020 - Bruno Donassolo, Univ. Grenoble Alpes, **(Reviewer- Rapporteure)**
  - Dec. 9th, 2019 - Ibrahim Fawaz, Télécom ParisTech **(Reviewer- Rapporteure)**
  - Oct. 28th, 2019 - Hussein Chour, CentraleSupélec, Rennes **(Reviewer- Rapporteure)**

  - Jul. 8th, 2019 - Nikolaos Liakopoulos, Université Sorbonne, Paris **(Examiner)**
  - Dec. 7th, 2018 - Xavier Leturc, Télécom ParisTech **(Examiner)**
  - Nov. 15th, 2018 - Antony Pottier, IMT Atlantique, Brest **(Examiner)**
  - Jan. 23rd, 2018 - Philippe Ezran, CentraleSupélec, Gif-sur-Yvette **(Examiner)**
  - Dec. 21st, 2017 - Chao Zhang, CentraleSupélec, Gif-sur-Yvette **(Examiner)**
  - Dec. 19th, 2017 - Faton Maliqi, CentraleSupélec, Gif-sur-Yvette **(Examiner)**
  - Jun. 19th, 2017 - Dora Boviz, Nokia, Paris-Saclay **(Examiner)**
  - Dec. 2nd, 2016 - Kenza Hamidouche, CentraleSupélec, Gif-sur-Yvette **(Examiner)**
- 2020 - Member of an Associate Professor (Enseignant-chercheur, CCIP) hiring committee, IMT Lille Douai, France.

Local responsibilities

- 2020 - Member of two Associate Professor (Enseignant-chercheur, CCIP) hiring committees, ESIEE-Cergy, France.
- 2017 and 2020 - Member of an Associate Professor (*Maître de Conférences*) hiring committee at ENSEA
- Sep. 2013 - Mar. 2016 - Elected Member of the Scientific Board of ENSEA

Technical program committees (TPC)

IEEE WCNC (2012, 2014, 2016-2018, 2021), IEEE WiOpt 2020, IEEE PIMRC (2018-2021), European Wireless (2018, 2020) IEEE 5G World Forum (2018, 2019, 2020), IEEE SPAWC 2019, IEEE ICNC (2013-2019), IEEE ICC (2012, 2014-2017), IEEE GLOBECOM (2013-2016), IEEE BlackSeaCom (2014-2018), GameSec 2014, IEEE INFOCOM 2013, IEEE SmartGridCom 2013, ACM ValueTools 2012, IEEE VTC-Fall 2011

Reviewing

- International journals: *IEEE Trans. on Signal Processing, IEEE Trans. on Inf. Theory, Trans. on Emerging Telecommun. Technologies (ETT), Eurasip JWCN, IEEE Trans on Commun., IEEE Trans. on Wireless Commun., IEEE Trans on Vehicular Technology, IEEE Commun. Lett., IEEE Journal on Sel. Areas in Commun., IEEE Trans. on Smart Grids, IEEE Wireless Commun. Lett.,* …

- Conferences: ICML, NeurIPS, IEEE GLOBECOM, IEEE ICC, IEEE VTC, IEEE ISIT, WiOpt, IEEE PIMRC, IEEE WCNC, IEEE ICNC, IEEE ICIP, Gamecomm, Rawnet, IEEE WCMC, ISWCS, IEEE ValueTools, GRETSI, …

3.2 Pedagogic and administrative responsibilities at ENSEA

- Since Sep. 2019, I am the head of the **Master of Engineering in Computer Science** - *Option IS - Informatique et Systèmes* at ENSEA;
  - management of the teaching activities (coordination with ENSEA permanent and exterior lecturers, schedule classes, labs and exams, final juries, ...), validation of Computer Science international exchange and double-diploma programs, validation of joint MSc (M2R) programs (*équivalences cursus conjoints*), validation of final internships (*stages de fin d'études*), co-management of the pluridisciplinary PLT project (jointly with Christophe Barès (ENSEA)), etc.
- During 2014-2015 and 2018-2019, I have been the co-responsible of the **Master of Engineering in Networks and Communications** - *Option RT - Réseaux et Télécommunications* at ENSEA jointly with Laura Luzzi (ENSEA);
  - validation of Communications and Networks international exchange and double-diploma programs, validation of joint MSc (M2R) programs (*équivalences cursus conjoints*), validation of final internships (*stages de fin d'études*), etc.
- Since Sep. 2020, I am an area Coordinator for the **International Relations** at ENSEA;
  - responsible of part of ENSEA's international network, i.e., the Eurasian Central Arc (*zone Răduleţ*): Czech Rep., Bulgaria, Romania, Greece, and Turkey
  - ensure communication between the international partners and the internal components of ENSEA: students, researchers and the international relations office; promote the international influence of ENSEA, its student and researcher exchanges (both incoming and outgoing); maintain or extend academic and/or research exchange agreements (student and researcher mobility projects), from the communication of exchange opportunities to the follow-up of the various trips; dual function of communicator and administrator of the area, etc.
- In 2018, I was a jury member of the **Mathematics Admissions Committee** at ENSEA, conducting mathematics examinations (*Concours ATS*);
- Since Dec. 2018, I am an elected member of the Technical Committee of ENSEA, as staff representative;
- Since Oct. 2020, I am an elected deputy member (of Marwa Chafii (ENSEA)) of the Administrative Board of ENSEA;

4 References

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5 Complete list of publications

5.1 Peer-reviewed intl. journal papers (post-PhD): 20 (two invited) + 1sub

[J28sub] I. Chafaa, R. Negrel, **E.V. Belmega**, and M. Debbah, "Unsupervised deep learning for mmWave beam steering exploiting sub-6 GHz channels", *submitted to IEEE Trans. on Wireless Commun.*, Apr. 2021.

[J27] M. Mitev, A. Chorti, **E.V. Belmega**, and H. V. Poor, "Protecting physical layer secret key generation from active attacks", *Entropy, Special Issue on Pysical-Layer Security, Quantum Key Distribution and Post-quantum cryptography*, **invited paper**, Jul. 2021.

[J26] S. Lakshminarayana, **E. V. Belmega**, and H. V. Poor, "Moving-Target Defense Against Cyber-Physical Attacks in Power Grids via Game Theory", *accepted paper, IEEE Trans. on Smart Grids*, Jun. 2021. *[JCR-indexed]*

[J25] H. El Hassani, A. Savard, and **E. V. Belmega**, "Adaptive NOMA in time-varying wireless networks with no CSIT/CDIT relying on a 1-bit feedback", *IEEE Wireless Commun. Lett.*, vol. 10, no. 4, pp. 750-754, Apr. 2021. *[JCR-indexed]*

[J24] I. Chafaa, **E.V. Belmega**, and M. Debbah, "One-bit Feedback exponential learning for beam alignment in mobile mmWave", *IEEE Access*, Oct. 2020. *[JCR-indexed]*

[J23] O. Bilenne, P. Mertikopoulos, and **E.V. Belmega**, "Fast Gradient-Free Optimization in Distributed Multi-User MIMO Systems", *IEEE Trans. on Signal Processing*, Oct. 2020. *[JCR-indexed]*

[J22] A. Savard, and **E.V. Belmega**, "A Cooperative D2D-Enabled Cellular Network under an Overall Power Constraint", *IEEE Access*, Sep. 2020. *[JCR-indexed]*

[J21] A. Marcastel, **E.V. Belmega**, P. Mertikopoulos, and I. Fijalkow, "Online power optimization in feedback-limited, dynamic and unpredictable IoT networks", *IEEE Trans. on Signal Processing*, vol. 67, no. 11, pp. 2987 – 3000, Jun. 2019. *[JCR-indexed]*

[J20] G. Rezgui, **E.V. Belmega**, and A. Chorti, "Mitigating jamming attacks using energy harvesting", *IEEE Wireless Commun. Lett.*, vol. 8, no. 1, pp. 297 – 300, Feb. 2019. *[JCR-indexed]*

[J19] **E.V. Belmega**, and A. Chorti, "Protecting secret key generation systems against jamming: Energy harvesting and channel hopping approaches", *IEEE Trans. on Information Forensics & Security*, vol. 12, no. 11, pp. 2611 – 2626, Nov. 2017. *[JCR-indexed]*

[J18] P. Mertikopoulos, **E.V. Belmega**, R. Negrel, and L. Sanguinetti, "Distributed stochastic optimization via matrix exponential learning", *IEEE Trans. on Signal Processing*, vol. 65, no. 9, pp. 2277 - 2290, May 2017. *[JCR-indexed]*

[J17] R. Masmoudi, **E.V. Belmega**, and I. Fijalkow, "Efficient Spectrum Scheduling and Power Management for Opportunistic Users", *EURASIP Journal on Wireless Communications and Networking (JWCN)*, vol. 2016:97, pp. 1 – 19, Apr. 2016. *[JCR-indexed]*

[J16] P. Mertikopoulos, and **E.V. Belmega**, "Learning to be green: robust energy efficiency maximization in dynamic MIMO-OFDM systems", *IEEE Journal on Selected Areas in Communication, Special Issue on Energy-Efficient Techniques for 5G Wireless Communication Systems*, vol. 34, no. 4, pp. 743 – 757, Apr. 2016. *[JCR-indexed]*

[J15] S. Gupta, **E.V. Belmega**, and M. A. Vasquez-Castro, "Game theoretical analysis of rate adaptation protocols conciliating QoS and QoE", *EURASIP Journal on Wireless Communications and Networking (JWCN), Special Issue on System Level Modeling in Future Wireless Communications*, vol. 2016:75, pp.1 – 18, Mar. 2016. *[JCR-indexed]*

[J14] **E.V. Belmega**, L. Sankar and H. V. Poor, "Enabling Data Exchange in Two-Agent Interactive State Estimation under Privacy Constraints", *IEEE Journal of Selected Topics in Signal Processing, Special Issue on Signal and Information Processing for Privacy*, vol. 9, no. 7, pp. 1285 –1297, Oct. 2015. *[JCR-indexed]*

[J13] G. Bacci, **E.V. Belmega**, P. Mertikopoulos, and L. Sanguinetti, "Energy-Aware Competitive Power Allocation for Heterogeneous Networks Under QoS Constraint", *IEEE Trans. on Wireless Communications*, vol. 14, no. 9, pp. 4728 – 4742, Sep. 2015. *[JCR-indexed]*

[J12] A.M. Masucci, **E.V. Belmega**, and I. Fijalkow, "Optimal Blockwise Subcarrier Allocation Policies in Single Carrier FDMA Uplink Systems", *EURASIP Journal on Advanced Signal Processing (JASP)*, vol. 2014:176, pp. 1 – 17, Nov. 2014. *[JCR-indexed]*

[J11] P. Mertikopoulos, and **E.V. Belmega**, "Transmit without Regrets: Online Optimization in MIMO-OFDM Cognitive Radio Systems", *IEEE Journal on Selected Areas in Communications, Cognitive Radio Series*, vol. 32, no. 11, pp. 1987–1999, Nov. 2014. *[JCR-indexed]*

[J10] L. Rose, **E.V. Belmega**, W. Saad, and M. Debbah, "Pricing in Heterogeneous Wireless Networks: Hierarchical Games and Dynamics", *IEEE Trans. on Wireless Communications*, vol. 13, no. 9, pp. 4985 – 5001, Sep. 2014. *[JCR-indexed]*

[J9] Y. Hayel, **E.V. Belmega**, and E. Altman, "Hawks and Doves in a dynamic framework", *Dynamic Games and Applications, Springer*, **invited paper**, vol.3, no. 1, pp 24 – 37, Aug. 2012. *[JCR-indexed]*

[J8] P. Mertikopoulos, **E.V. Belmega**, A. Moustakas, and S. Lasaulce, "Distributed learning policies for power allocation in multiple access channels", *IEEE Journal on Selected Areas in Communications*, vol. 30, no.1, pp. 96 – 106, Jan. 2012. *[JCR-indexed]*

5.2 Peer-reviewed intl. journal papers (PhD): 7 (one invited)

[J7] **E.V. Belmega**, M. Jungers, and S. Lasaulce, "A generalization of a trace inequality for positive definite matrices", *The Australian Journal of Mathematical Analysis and Applications (AJMAA)*, vol. 7, no. 2, pp. 1-5, May 2011.

[J6] **E.V. Belmega** and S. Lasaulce, "Energy-efficient precoding for multiple-antenna terminals", *IEEE. Trans. on Signal Processing*, vol. 59, no. 1, pp. 329–340, Jan. 2011. *[JCR-indexed]*

[J5] **E.V. Belmega**, B. Djeumou, and S. Lasaulce, "Power allocation games in interference relay channels: Existence analysis of Nash equilibria", *EURASIP Journal on Wireless Communications and Networking (JWCN)*, pp. 120, DOI:10.1155/2010/583462, Nov. 2010. *[JCR-indexed]*

[J4] **E.V. Belmega**, S. Lasaulce, M. Debbah, M. Jungers, and J. Dumont, "Power allocation games in wireless networks of multi-antenna terminals", *Springer Telecommunication Systems Journal*, vol. 47, no. 1, pp. 109–122, DOI: 10.1007/s11235-010-9305-3, **invited paper**, May 2010. *[JCR-indexed]*

[J3] **E.V. Belmega**, S. Lasaulce, and M. Debbah, "Power allocation games for MIMO multiple access channels with coordination", *IEEE Trans. on Wireless Communications*, vol. 8, no. 6, pp. 3182–3192, Jun. 2009. *[JCR-indexed]*

[J2] **E.V. Belmega**, S. Lasaulce, and M. Debbah, "A trace inequality for positive definite matrices", *Journal of Inequalities in Pure and Applied Mathematics (JIPAM)*, vol. 10, no. 1, pp. 1-4, Jan. 2009.

[J1] **E.V. Belmega**, B. Djeumou, and S. Lasaulce, "Gaussian broadcast channels with an orthogonal and bidirectionnal cooperation link", *EURASIP J. on Wireless Communications and Networking (JWCN)*, pp.1–16, doi:10.1155/2008/341726, Apr. 2008. *[JCR-indexed]*

5.3 Book chapters: 4

[BC4] V. Varma, **E.V. Belmega**, S. Lasaulce, and M. Debbah, "Energy Efficient Communications in MIMO Wireless Channels", *Green Communications: Theoretical Fundamentals, Algorithms, and Applications*, CRC Press, Sep. 2012.

[BC3] **E.V. Belmega**, S. Lasaulce, H. Tembiné, and M. Debbah, "Rate-efficient power allocation games", *Game Theory and Learning for Wireless Networks: Fundamentals and Applications, ISBN 9780123846983*, Academic Press, Elsevier, Jul. 2011.

[BC2] **E.V. Belmega**, S. Lasaulce, and M. Debbah, "Shannon rate efficient power allocation games", *Game Theory for Wireless Communications and Networking*, Auerbach Publications, Taylor and Francis Group, CRC Press, Apr. 2010.

[BC1] **E.V. Belmega**, S. Lasaulce, and M. Debbah, "Capacity of cooperative channels: three terminals case study", *Cooperative Wireless Communication, ISBN 142006469X*, Auerbach Publications, Taylor and Francis Group, CRC Press, Oct. 2008.

5.4 Peer-reviewed intl. conference papers (post-PhD): 40 (6 invited)

[C51] H. El Hassani, A. Savard, and **E. V. Belmega**, and R. C. de Lamare, "Energy-efficient Cooperative Backscattering Closed-Form Solution for NOMA", *accepted paper, IEEE GLOBECOM*, Aug. 2021.

[C50] H. El Hassani, A. Savard, and **E.V. Belmega**,"Energy-efficient 1-bit feedback NOMA in wireless networks with no CSIT/CDIT", *IEEE SSP*, Jul. 2021.

[C49] I. Chafaa, R. Negrel, **E.V. Belmega**, and M. Debbah, "Federated channel-beam mapping: from sub-6GHz to mmWave", *IEEE WCNC, Workshop on Distributed Machine Learning for Future Communications and Networking*, Mar. 2021.

[C48] K. Antonakopoulos, **E. V. Belmega**, and P. Mertikopoulos, "Adaptive extra-gradient method for Min-Max optimization and games", *ICLR, 9th Intl. Conf. on Learning Representations*, Jan. 2021. *[alphabetical order]*

[C47] H. El Hassani, A. Savard, and **E.V. Belmega**, "A closed-form solution for energy-efficiency optimization in multi-user downlink NOMA", *IEEE PIMRC*, Sep. 2020.

[C46] A. Savard, and **E.V. Belmega**, "Optimal Power Allocation Policies in Multi-hop Cognitive Radio Networks", *IEEE PIMRC*, Sep. 2020.

[C45] O. Bilenne, P. Mertikopoulos, and **E.V. Belmega**, "Derivative-free optimization over multi-user MIMO networks", **invited paper**, *NetGCoop*, Cargese, Corsica, 2020.

[C44] I. Chafaa, **E.V. Belmega**, and M. Debbah, "Exploiting Channel Sparsity for Beam Alignment in mmWave Systems via Exponential Learning", *IEEE ICC, Open Workshop on Machine Learning for Communications (ML4COM)*, Dublin, Ireland, Jun 2020.

[C43] K. Antonakopoulos, **E. V. Belmega**, and P. Mertikopoulos, "Online and stochastic optimization beyond Lipschitz continuity: A Riemannian approach", *ICLR, 8th Intl. Conf. on Learning Representations*, Addis Ababa, Ethiopia, Apr. 2020. *[alphabetical order,* ***selected for spotlight talk****]*

[C42] K. Antonakopoulos, **E.V. Belmega**, and P. Mertikopoulos, "An adaptive Mirror-Prox method for variational inequalities with singular operators", *In NeurIPS '19: Proc. of the 33rd Intl. Conf. on Neural Information Proc. Sys., 2019*, Dec. 2019. *[alphabetical order]*

[C41] S. Lakshminarayana, **E.V. Belmega**, and H. V. Poor, "Moving-Target Defense for Detecting Coordinated Cyber-Physical Attacks in Power Grids", *IEEE SmartGridCom 2019*, Oct. 2019.

[C40] M. Mitev, A. Chorti, **E.V. Belmega**, and M.J. Reed, "Man-in-the-Middle and Denial of Service Attacks in Wireless Secret Key Generation", *IEEE GLOBECOM 2019*, Dec. 2019.

[C39] A. Marcastel, **E.V. Belmega**, P. Mertikopoulos, and I. Fijalkow, "Gradient-free online resource allocation algorithms for dynamic wireless networks", **invited paper**, *IEEE SPAWC 2019*, Nice, France, Jul. 2019.

[C38] I. Chafaa, **E.V. Belmega**, and M. Debbah, "Adversarial Multi-armed Bandit for mmWave Beam Alignment with One-Bit Feedback", *ACM ValueTools 2019*, Palma de Mallorca, Spain, Mar. 2019.

[C37] A. Savard, and **E.V. Belmega**, "Optimal Power Allocation in a Relay-aided Cognitive Network", *ACM ValueTools 2019*, Palma de Mallorca, Spain, Mar. 2019.

[C36] R. Masmoudi, **E.V. Belmega**, and I. Fijalkow, "Impact of Imperfect CSI on Resource Allocation in Cognitive Radio Channels", *International Workshop on Pervasive and Context-Aware Middleware (PerCAM 17) IEEE WiMOB 2017*, Rome, Italy, Oct. 2017.

[C35] **E.V. Belmega**, and A. Chorti, "Energy Harvesting in Secret Key Generation Systems under Jamming Attacks", *IEEE International Conference on Communications (IEEE ICC)*, Paris, France, May 2017.

[C34] A. Chorti, and **E.V. Belmega**, "Secret Key Generation in Rayleigh Block Fading AWGN Channels under Jamming Attacks", *IEEE International Conference on Communications (IEEE ICC)*, Paris, France, May 2017.

[C33] A. Marcastel, **E.V. Belmega**, P. Mertikopoulos, and I. Fijalkow, "Interference Mitigation via Pricing in Time-Varying Cognitive Radio Systems", **invited paper**, *NETGCOOP 2016*, Avignon, France, Nov. 2016.

[C32] P. Mertikopoulos, **E.V. Belmega**, and L. Sanguinetti, "Distributed learning for resource allocation under uncertainty", *IEEE GlobalSIP*, Washington DC, USA, 7-9 Dec. 2016.

[C31] A. Marcastel, **E.V. Belmega**, P. Mertikopoulos, and I. Fijalkow, "Online Interference Mitigation via Learning in Dynamic IoT Environments", *IOE worksop in IEEE GLOBECOM 2016*, Washington DC, USA, 4-8 Dec. 2016.

[C30] A. Marcastel, **E.V. Belmega**, P. Mertikopoulos, and I. Fijalkow, "Online power allocation for opportunistic radio access in dynamic OFDM networks", *IEEE VTC-Fall 2016*, Montreal, Canada, 18-21 Sep. 2016.

[C29] R. Masmoudi, **E.V. Belmega**, I. Fijalkow, and N. Sellami, "Joint scheduling and power allocation in cognitive radio systems", *Advances in Software Defined and Context Aware Cognitive Networks (SCAN) Workshop, IEEE International Conference on Communications (IEEE ICC)*, pp. 399-404, London, UK, 8-12 Jun. 2015.

[C28] C. Zhang, S. Lasaulce, and **E.V. Belmega**, "Using more bandwidth can be detrimental to the global performance in distributed wireless channels", *Small Cell and 5G Networks (SmallNets) Workshop, IEEE International Conference on Communications (IEEE ICC)*, pp. 142-147, London, UK, 8-12 Jun. 2015.

[C27] **E.V. Belmega**, and P. Mertikopoulos, "Energy-Efficient Power Allocation in Dynamic Multi-Carrier Systems", *IEEE VTC-Spring*, Glasgow, Scotland, May 2015.

[C26] S. Gupta, **E.V. Belmega**, and M.A. Vasquez-Castro, "Game Theoretical Analysis of the Tradeoff Between QoE and QoS Over Satellite Channels", *7th Advanced Satellite Multimedia Systems Conference 13th Signal Processing for Space Communications Workshop (ASMS/SPSC)*, Livorno, Italy, Sep. 2014.

[C25] R. Masmoudi, **E.V. Belmega**, I. Fijalkow, and N. Sellami, "A unifying view on energy-efficiency metrics in cognitive radio channels", *European Signal Processing Conference (EUSIPCO)*, Lisbon, Portugal, Sep. 2014.

[C24] G. Bacci, **E.V. Belmega**, P. Mertikopoulos, and L. Sanguinetti, "Energy-aware competitive link adaptation in small-cell networks", *The 10th International Workshop on Resource Allocation in Wireless Networks (RAWNET), WiOpt 2014*, **invited paper**, Hammamet, Tunisia, May 2014.

[C23] G. Bacci, **E.V. Belmega**, and L. Sanguinetti, "Distributed energy-efficient power and subcarrier allocation for OFDMA-based small cells", *IEEE International Conf. on Communications (ICC 2014), Workshop on Small Cell and 5G Networks*, Sydney, Australia, Jun. 2014.

[C22] G. Bacci, **E.V. Belmega**, and L. Sanguinetti, "Distributed energy-efficient power optimization in cellular relay networks with minimum rate constraints", *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Florence, Italy, May 2014.

[C21] P. Mertikopoulos, and **E.V. Belmega**, "Distributed Spectrum Management in MIMO-OFDM Cognitive Radio: An Exponential Learning Approach", *ACM International Conference on Performance Evaluation Methodologies and Tools VALUETOOLS 2013*, Torino, Italy, 10-12 Dec. 2013.

[C20] A.M. Masucci, I. Fijalkow, and **E.V. Belmega**, "Subcarrier allocation in coded OFDMA uplink systems: Diversity versus CFO", *IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC)*, London, United Kingdom, Sep. 2013.

[C19] **E.V. Belmega**, L. Sankar and H. V. Poor, "Repeated games for privacy-aware distributed state estimation in interconnected networks", *IEEE International Conf. on NETwork Games, COntrol and OPtimization (NETGCOOP)*, Avignon, France, **invited paper**, Nov. 2012.

[C18] R. Masmoudi, **E.V. Belmega**, I. Fijalkow, and N. Sellami, "A Closed-Form Solution to the Power Minimization Problem over Two Orthogonal Frequency Bands under QoS and Cognitive Radio Interference Constraints", *IEEE Dynamic Spectrum Access Networks (DySpan)*, Bellevue, Washington, USA, Oct. 2012.

[C17] L. Rose, **E.V. Belmega**, W. Saad, and M. Debbah, "Dynamic Service Selection Games in Heterogeneous Small Cell Networks with Multiple Providers", *IEEE International Symposium on Wireless Communication Systems (ISWCS)*, Paris, France, Aug. 2012.

[C16] P. Mertikopoulos, **E.V. Belmega**, and A. Moustakas, "Matrix Exponential Learning: Distributed Optimization in MIMO systems", *IEEE International Symposium on Information Theory (ISIT)*, Cambridge, MA, USA, Jun. 2012.

[C15] **E.V. Belmega**, L. Sankar, H. V. Poor, and M. Debbah, "Pricing Mechanisms for Cooperative State Estimation", ISCCSP 2012, Roma, Italy, **invited paper**, May 2012.

[C14] Y. Hayel, **E.V. Belmega**, and E. Altman, "Hawks and Doves in a Dynamic Framework", *IEEE International Conf. on NETwork Games, COntrol and OPtimization (NETGCOOP)*, Paris, France, Oct. 2011.

[C13] C.M.G. Gussen, **E.V. Belmega**, and M. Debbah, "Pricing and bandwidth allocation problems in wireless multi-tier networks", *IEEE Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, CA, USA, Nov. 2011.

[C12] P. Mertikopoulos, **E.V. Belmega**, A. Moustakas and S. Lasaulce, "Power Allocation Games in Parallel Multiple Access Channels", *ACM International Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS)*, ENS Cachan, France, May 2011.

5.5 Peer-reviewed intl. conference papers (PhD): 11 (7 invited)

[C11] **E.V. Belmega**, H. Tembine, and S. Lasaulce, "Learning to precode in outage minimization games over MIMO interference channels", *IEEE Asilomar Conf. on Signals, Systems, and Computers*, Pacific Grove, CA, USA, **invited paper**, Nov. 2010.

[C10] **E.V. Belmega**, S. Lasaulce, and M. Debbah, "A survey on energy-efficient communications", *IEEE Intl. Symp. on Personal, Indoor and Mobile Radio Communications (PIMRC 2010)*, Istanbul, Turkey, **invited paper**, Sep. 2010.

[C9] **E.V. Belmega**, S. Lasaulce, M. Debbah, and A. Hjørungnes, "Learning Distributed Power Allocation Policies in MIMO Channels", *European Signal Processing Conference (EUSIPCO)*, Aalborg, Denmark, **invited paper**, Aug. 2010.

[C8] S. Medina Perlaza, **E.V. Belmega**, S. Lasaulce, and M. Debbah, "On the base station selection and base station sharing in self-configuring networks", *ACM International Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS)*, Pisa, Italy, **invited paper**, Oct. 2009.

[C7] **E.V. Belmega**, and S. Lasaulce, "How useful are multiple antennas in energy-efficient power control games? An information theoretic answer", *ACM International Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS)*, Pisa, Italy, Oct. 2009.

[C6] **E.V. Belmega**, S. Lasaulce, M. Debbah, and A. Hjørungnes "A new energy efficiency function for quasi-static MIMO channels", *International Wireless Communications and Mobile Computing Conference (IWCMC)*, Leipzig, Germany, **invited paper**, Jun. 2009.

[C5] **E.V. Belmega**, B. Djeumou, and S. Lasaulce "Resource allocation games in interference relay channels", *IEEE Intl. Conference on Game Theory for Networks (Gamenets)*, Istanbul, Turkey, **invited paper**, May 2009.

[C4] **E.V. Belmega**, B. Djeumou, and S. Lasaulce "What happens when cognitive terminals compete for a relay node?", *IEEE Intl. Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Taipei, Taiwan, 1–4 Apr. 2009.

[C3] **E.V. Belmega**, S. Lasaulce, and M. Debbah "Power Control in Distributed Multiple Access Channels with Coordination", *IEEE/ACM Proc. of the Intl. Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks and Workshops (WIOPT)*, Berlin, Germany, 1–8 Apr. 2008.

[C2] **E.V. Belmega**, S. Lasaulce, and M. Debbah, "Decentralized handovers in cellular networks with cognitive terminals", *in the IEEE Proc. of the 3rd International Symposium on Communications, Control and Signal Processing (ISCCSP)*, St Julians, Malta, **invited paper**, 12–14 Mar. 2008.

[C1] **E.V. Belmega**, B. Djeumou, and S. Lasaulce, "Performance analysis for the AF-based frequency division cooperative broadcast channel", *in the IEEE Proceedings of the Signal Processing Advances in Wireless Communications conference (SPAWC)*, Helsinki, Finland, 1–5 Jun. 2007.

5.6 Peer-reviewed national conference papers: 6

[CF6] A. Savard, and **E.V. Belmega**, "Allocation de puissance pour les réseaux radio cognitifs à relais", *GRETSI*, Lille, France, Sep. 2019.

[CF5] R. Masmoudi, **E.V. Belmega**, I. Fijalkow, and N. Sellami, "Allocation de spectre et de puissance dans les systèmes Radio Cognitives", *GRETSI*, Lyon, France, Sep. 2015.

[CF4] A.M. Masucci, I. Fijalkow, and **E.V. Belmega**, "Politiques optimales d'allocation de blocs de sous-porteuses dans les systèmes OFDMA codés sans connaissance du canal", *GRETSI*, Brest, France, Sep. 2013.

[CF3] B. Djeumou, **E.V. Belmega**, and S. Lasaulce, "Régions de taux atteignables pour le canal à interférence à relais", *GRETSI*, Dijon, France, Sep. 2009.

[CF2] **E.V. Belmega**, B. Djeumou, and S. Lasaulce "Jeux d'allocation de puissance pour les canaux à interférence à relais", *GRETSI*, Dijon, France, Sep. 2009.

[CF1] B. Djeumou, **E.V. Belmega**, and S. Lasaulce, "Recombinaison de signaux décodés et transférés pour le canal à relais à division fréquentielle", *GRETSI*, Troyes, France, 1–4 Sep. 2007.

5.7 Invited talks (selection)

[IT10] L2S, CentraleSupélec, zoom, Jun. 2021
"Online optimization and machine learning: Applications to resource allocation problems in wireless networks"

[IT9] ENSTA Paris (UMA), zoom, Feb. 2021
"Online convex optimization for resource allocation problems in distributed wireless networks"

[IT8] Paris Symposium on Games, Institut Henri Poincaré (IHP), Paris, France, Jun. 2018
"An application of online mirror descent to wireless communications"

[IT7] Transversal Problems in Complexity, Maison Internationale de la Recherche, Cergy-Pontoise, France, May 2018
"Online mirror descent: An application to wireless communications"

[IT6] Lycée Chrestien de Troyes, France, Nov. 2017
"Introduction à la théorie des jeux et ses applications en communications"

[IT5] GDR ISIS Journée Eco Radio, Télécom ParisTech, Paris, France, May 2015 - and - INRIA Rhône Alpes, Grenoble, Oct. 2015
"Energy-efficient power allocation in dynamic multi-carrier systems"

[IT4] CTTC, Barcelona, Spain, Jul. 2013
"Repeated games for privacy-aware distributed state estimation"

[IT3] Workshop on Algorithmic Game Theory: Learning Algorithms and Dynamics in Distributed Systems (AlgoGT), St. Nizier du Moucherotte, France, Jul. 2013
"Hierarchical games and dynamics in HetNets pricing problems"

[IT2] Signal Processing and Optimization for Wireless Communications: **In Memory of Are Hjørungnes** Workshop, Trondheim, Norway, May 2013
"On a matrix trace inequality"

[IT1] GDR ISIS Journée Smart Grids, Télécom ParisTech, Paris, France, Oct. 2011
"Pricing mechanisms for cooperative state estimation"

5.8 Thesis

[HDR] **E. V. Belmega**, "Contributions to energy-efficient wireless communications exploiting games, online optimization and learning (Contributions aux communications sans fil efficaces en énergie exploitant la théorie des jeux, l'optimisation en ligne et l'apprentissage)", HDR Thesis, Université de Cergy-Pontoise, 29 Mars 2019, Cergy-Pontoise, France.

[PHD] **E. V. Belmega**, "On resource allocation problems in distributed MIMO wireless networks (Problémes d'allocation des ressources dans les réseaux MIMO sans fil distribués)", Ph.D. Dissertation, Université Paris Sud-11, 14 December 2010, Gif-sur-Yvette, France, Advisors: S. Lasaulce and M. Debbah.