

Tomàs Ortega

Curriculum Vitae

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I am currently studying the communications requirements for convergence of distributed optimization algorithms in a network. This includes algorithms for Federated Learning and Decentralized Control.

Education

- 2021 – present **Ph.D. in Electrical Engineering and Computer Science**, *University of California, Irvine, Irvine.*
- 2020 – 2021 **Master's degree in Mathematics**, *Master's in Advanced Mathematics and Mathematical Engineering, UPC, Barcelona.*
- 2015 – 2020 **Bachelor's degree in Mathematics**, *CFIS, UPC, Barcelona.*
- 2015 – 2020 **Bachelor's degree in Telecommunications Engineering**, *CFIS, UPC, Barcelona.*

Professional and Research Experience

- June – August 2022 **Graduate Fellow at NASA Jet Propulsion Laboratory**, *Designing and supervising the experimental tests for the channel sounding of Lunar South Pole communications. Developing novel algorithms for cooperative and compressed localization, Pasadena.*
- September 2020 – January 2021 **Research Assistant at UPC (Signal Theory and Communications Department)**, *Design and optimization of 5G coverage estimators in urban scenarios, along with implementation and testing of the proposed solutions, Barcelona.*
- February – July 2020 **JVSRP Internship at NASA Jet Propulsion Laboratory**, *Development and implementation of an adaptive-sweep algorithm for carrier acquisition and tracking in spacecraft radios ([link to publication](#)), Pasadena.*
- January – July 2019 **Research Project Collaborator at HP**, *Design of a ultrasound positioning system for mobile printers, with an emphasis on the position calculation and communications software, Barcelona.*
- Summer of 2018 **Summer Internship at BaseTIS**, *Enhancing task automation and parallelization for data analysis and reporting for Gas Natural Informatica, Barcelona.*

Publications

Tomas Ortega and Hamid Jafarkhani. Asynchronous federated learning with bidirectional quantized communications and buffered aggregation. *2023 International Conference on Machine Learning, Federated Learning and Analytics in Practice Workshop*, July 2023. URL: <https://openreview.net/pdf?id=DORg4vHAIV>.

Tomas Ortega and Hamid Jafarkhani. Decentralized optimization in networks with arbitrary delays. *under review*, November 2023.

Tomas Ortega and Hamid Jafarkhani. Gossiped and quantized online multi-kernel learning. *IEEE Signal Processing Letters*, 30:468–472, 2023. doi:10.1109/LSP.2023.3268988.

Tomas Ortega and Hamid Jafarkhani. Quantized and asynchronous federated learning. *under review*, November 2023.

Tomas Ortega, Marc Sanchez Net, Kar-Ming Cheung, and Dariush Divsalar. Adaptive-sweep algorithm for spacecraft carrier acquisition and tracking: System analysis and implementation. In *2021 IEEE Aerospace Conference (50100)*, pages 1–9, 2021. doi:10.1109/AERO50100.2021.9438340.

Tomas Ortega, Marc Sanchez Net, Dariush Divsalar, and Kar-Ming Cheung. Acquisition and tracking of high dynamics doppler profiles for space applications. In *2021 IEEE Aerospace Conference (50100)*, pages 1–20, 2021. doi:10.1109/AERO50100.2021.9438418.

Tomàs Ortega, Antonio Pascual-Iserte, and Olga Muñoz. Los/nlos estimators for mmwave cellular systems with blockages. *IEEE Wireless Communications Letters*, 11(1):121–125, 2022. doi:10.1109/LWC.2021.3122090.

Languages

Spanish	Native	<i>C1 certificate</i>
Catalan	Native	<i>C1 certificate</i>
English	Proficient	<i>Cambridge Proficiency certificate</i>
French	Good	<i>Delf certificate</i>

Other Merits and Awards

- 2023 **IEEE Signal Processing Society**, *Signal Processing Scholarship*, awarded.
- 2023 **ICML Federated Learning Workshop**, *Early Career invitation*, awarded.
- 2023 **Catalan Society of Mathematics**, *Évariste Galois prize for best MSc thesis in Catalonia*, honorable mention.
- 2022 **NASA's Jet Propulsion Laboratory**, *JPL Graduate Fellowship*, awarded.
- 2021 **UCI**, *Electrical Engineering and Computer Science department fellowship*, awarded.
- 2021 **Balsells program**, *Balsells graduate fellowship*, awarded.
- 2020 **Google Hash Code**, *2nd team Spain*, 171th global.
- 2019 **Google Hash Code**, *1st team Spain*, 75th global.
- 2018 **Kernel Analytics Datathon**, *2nd place*, Accuracy when classifying Parkinson's Disease onset of symptomatology using sensor data.
- 2018 **Google Hash Code**, *1st team Spain*, 53rd global.
- 2015 **CFIS**, *CFIS scholarship*, awarded.
- 2015 **UAB - ARGÓ prize for a mathematics and programming project**, awarded, I developed a free and open-source Android App called MAT. It allows users to solve some high school level math problems and is available on Google Play.

- 2015 **Spanish Programming Olympiad**, *finalist*.
2014 **CIMS Cellex Program**, *shortlisted*.

Other Appointments and Experience

- September 2023 – present **Graduate Student Representative at the UCI Council on Planning and Budget**, *Representing the Graduate students at the UCI Council on Planning and Budget*, Irvine.
- September 2023 – present **Graduate Student Representative at the UCI Samueli School of Engineering Graduate Studies Committee**, *Representing the Graduate students at the Graduate Studies Committee*, Irvine.
- May 2023 – present **Council member for the School of Engineering at UCI's AGS**, *Representing the School of Engineering at the elected Associated Graduate Students council*, Irvine.

Other Courses and Seminars

- Seminar on quantum and classical error-correcting codes, organized by Simeon Ball, UPC (2021)
- Online Course - **Using Python for Research**, offered by Jukka-Pekka Onnela, Harvard University (2020)
- Summer Course - FME 1st Course of Introduction to Research, organized by Juanjo Rué, UPC (2019)
- Summer Course - JAE School of Mathematics, organized by Yago Antolín and Mario García Fernández, ICMAT-UAM (2019)
- Winter Course - Game Theory, offered by Josep Freixas, UPC (2019)
- Winter Course - Introduction to Deep Learning, organized by Xavier Giró, UPC (2018)
- Summer Course - BarcelonaTech Mathematics Summer Camp, organized by Fundació Privada Cellex, UPC (2015)
- Online Course - Programming Mobile Applications for Android Handheld Systems, offered by Adam Porter, University of Maryland (2014)
- Summer Course - Programming and algorithmics, offered by Salvador Roura and Jordi Petit, UPC (2014) and (2013)
- Summer Course – Computer graphics, offered by Àlvar Vinacua, UPC (2013)