

EDUCATION

- **University of Illinois at Urbana-Champaign** Urbana, IL
Ph.D. in Computer Science Fall 2015 – Fall 2021 (expected)
 - **Advisor:** Prof. Josep Torrellas
 - **Area:** Computer Architecture, Parallel Computing, and Systems
 - **Thesis:** Application Of Extremely High-frequency Wireless On-chip Communication In Manycore Architectures
- **University of Illinois at Urbana-Champaign** Urbana, IL
M.S. in Computer Science Fall 2019
 - **Advisor:** Prof. Josep Torrellas
 - **Relevant coursework:** Machine Learning for Signal Processing; Designing Applications for Extreme Scale Systems; Parallel Computer Architecture; Design and Implementation of Scripting Languages; Operating Systems Design; Wireless Networks and Mobile Systems
- **Polytechnic University of Valencia** Valencia, Spain
B.S. in Telecommunications Engineering; Summa Cum Laude Spring 2015
 - **Senior Thesis:** Numerical Methods for Nonlinear Modeling. Grade: 10/10 with Honors
 - **Overseas studies:** Norwegian University of Science and Technology (NTNU), Fall 2014
 - **Relevant coursework:** Computer Architecture; Digital Signal Processing; Probability and Random Signals; Database Systems; Network Security; Radiation and Wave Propagation; Optical and Satellite Communications

PUBLICATIONS

- X. Timoneda, S. Abadal, **A. Franques**, J. Zhou, D. Manassis, J. Torrellas, A. Cabellos-Aparicio, E. Alarcon, “*Engineer the Channel and Adapt to it: Enabling Wireless Intra-Chip Communication*”, IEEE Transactions on Communications, doi: 10.1109/TCOMM.2020.2973988, February 2020
- [U.S. Patent] S. Blagodurov, **A. Franques**, “*Communication Engine for Hybrid Interconnect Technologies*”, US Patent App. 16/588,612. Filed: September 30, 2019
- [ASPLOS ’19] V. Fernando, **A. Franques**, S. Abadal, S. Misailovic, J. Torrellas, “*Replica: A Wireless Manycore for Communication-Intensive and Approximate Data*”, The 24th ACM International Conference on Architectural Support for Programming Languages and Operating Systems, April 2019. *Acceptance Rate: 21%*
- [ISCAS ’19] S. Abadal, A. Marruedo, **A. Franques**, H. Taghvaei, A. Cabellos-Aparicio, J. Zhou, J. Torrellas, E. Alarcón, “*Opportunistic Beamforming in Wireless Network-on-Chip*”, IEEE International Symposium on Circuits and Systems, May 2019
- [ISCAS ’18] X. Timoneda, S. Abadal, A. Cabellos-Aparicio, D. Manassis, J. Zhou, **A. Franques**, J. Torrellas, E. Alarcon, “*Millimeter-Wave Propagation within a Computer Chip Package*”, IEEE International Symposium on Circuits and Systems, May 2018
- A. Cordero, **A. Franques** and J.R. Torregrosa, “*Chaos and Convergence of a Family Generalizing Homeier’s Method with Damping Parameters*”, Nonlinear Dynamics, 85(3) 1939-1954, August 2016
- A. Cordero, **A. Franques** and J.R. Torregrosa, “*Multidimensional Homeier’s Generalized Class and Its Application to Planar 1D Bratu Problem*”, SeMA Journal, 70(1) 1-10, October 2015
- A. Cordero, **A. Franques** and J.R. Torregrosa, “*Numerical Solution of Turbulence Problems by Solving Burgers’ Equation*”, Algorithms, 8(6) 224-233, May 2015
- [ECT ’14] A. Cordero, L. Feng, **A. Franques** and J.R. Torregrosa, “*Stability of a Fourth-Order Family of Iterative Methods for Solving Nonlinear Problems*”, International Conference on Engineering Computational Technology, September 2014

EXPERIENCE

- **AMD Research** Bellevue, WA and Austin, TX
• *Co-Op Engineer* Fall 2018 – Spring 2019
 - **Mentor:** John Wilkes, **Manager:** Andrew Kegel
 - **Project:** PathForward program to accelerate critical computing technologies for the nation's first exascale supercomputers. *Project funded by the U.S. Department of Energy – Exascale Computing Project.*
 - Developed and benchmarked driver and library software to evaluate the capabilities and performance of prototype hardware for exascale computing.
 - Authored a U.S. patent for hybrid interconnect technologies.
- **I-ACOMA Group** University of Illinois at Urbana-Champaign, Urbana, IL
• *Graduate Research Assistant* Fall 2015 – Present
 - **Advisor:** Prof. Josep Torrellas
 - **Area:** Computer Architecture, Parallel Computing, and Systems
 - **Project:** XPS: FULL: Breaking the Scalability Wall of Shared Memory through Fast On-Chip Wireless Communication. *Grant Awarded by the U.S. National Science Foundation (#1629431): \$880,000*
 - Designed a novel highly-scalable shared-memory chip multiprocessor, called *Replica*, using on-chip wireless communication. Evaluated performance using Multi2Sim and energy consumption with McPAT
 - Developed new medium access control protocol for *Replica*; it dynamically adapts to different computational patterns, minimizing transmission latency and increasing the overall throughput of the chip
- **University of Illinois at Urbana-Champaign** Urbana, IL
• *Teaching Assistant* Fall 2016
 - **Course:** CS/ECE 439 Wireless Networks – Prof. Robin Kravets
 - Occasional lecturer. Provided support and advice to 40+ students throughout development of class projects
- **DAMRES Numerical Analysis Lab** Polytechnic University of Valencia, Valencia, Spain
• *Undergraduate Research Assistant* Fall 2013 – Spring 2015
 - **Advisors:** Profs. Juan Ramon Torregrosa and Alicia Cordero
 - **Area:** Computational Mathematics
 - Designed a new set of highly efficient and stable iterative methods for solving nonlinear partial differential equations
 - Applied and analyzed these methods using Matlab to Bratu's problem and Burgers's equation (used in Physics)
 - Designed with Mathematica a new way of discretizing Burgers's equation; increased accuracy, reduced cost
- **Montblanc City Council** Montblanc, Spain
• *System Administrator, Intern* Summer 2010
 - Performed maintenance of Cisco devices, Apache on Linux servers, and database management with MySQL
 - Web development with PHP, HTML, Javascript, and CSS

COURSE PROJECTS

- **N-Body Problem in Akka:** implementation and performance analysis of the Direct Gravitational N-Body problem in Akka; a very popular framework for actor-based concurrency
- **CMat – The Language and Its Interpreter:** implementation and evaluation of an interpreter in Python for CMat; a custom-designed blended subset of Matlab, C and Cool
- **Development of a VGA Driver for an FPGA:** written in Verilog and implemented in an Altera DE2 Board (which included an Altera 90nm Cyclone II FPGA). The design software used was Altera Quartus II
- **Mastermind in 68000 assembly language with EASy68K:** implementation of the Mastermind game in 68000 Assembly (the assembly language for the Motorola 68K-series microprocessors). Simulated with EASy68K

PERSONAL PROJECTS

- **Quovis:** Android App for saving, organizing, and retrieving users' favorite locations on top of Google Maps
- **Lazarius:** Android App for helping reduced-vision people move around cities in real time. *Won second prize and Telefonica Award in the 2015 Spanish edition of Hack For Good*
- **2 Park:** Android App for managing parking spaces on the street in real time. *Won Telefonica Award in the 2014 Spanish edition of Hack For Good*

AWARDS, HONORS, AND SCHOLARSHIPS

- **Student Travel Grants**, awarded by NSF, IEEE, and ACM, to attend ISCA (2017, 2018), ASPLOS (2019), and MICRO (2019)
- Award for the **Second-Best Academic Record**, Polytechnic University of Valencia, Class of 2015
- **4-Year Undergraduate Full Tuition Scholarship**, Spanish Ministry of Education, 2011-2015
- **Erasmus Programme Grant**, European Commission, 2014
- **Undergraduate Research Fellowship**, Spanish Ministry of Education, 2013, 2014

SERVICE

- Technical Program Committee Member of the International Workshop on Network on Chip Architectures (NOCARC '19), held in conjunction with MICRO 2019
- President of the Spanish Student Association at the University of Illinois at Urbana-Champaign, since 2019
- Graduate Student Ambassador & Mentor, University of Illinois at Urbana-Champaign, since 2018
- Journal Reviewer for Nano Communication Networks (Elsevier), since 2018
- Member, IEEE Computer Society Technical Committee on Computer Architecture (IEEE TCCA), since 2017
- Member, Association for Computing Machinery Special Interest Group on Computer Architecture (ACM SIGARCH), since 2017
- Incoming Exchange Students' Mentor, Polytechnic University of Valencia, 2013 – 2014

SKILLS

- **Programming Languages**: C/C++, Python, Java, Scala, Verilog, PHP, Javascript, SQL
- **Frameworks & Tools**: MPI, Akka, Matlab, Mathematica, Git, Matplotlib, Flex, Bison, HTML, CSS, L^AT_EX
- **Architectural Simulators**: Multi2Sim, Gem5, McPAT, ZSim
- **Languages**: English (Fluent), Spanish (Native), Catalan (Native)

OTHER INTERESTS AND HOBBIES

- Mountaineering (including Rock Climbing, Ski Touring, and Trekking), Cooking and Nutrition