Antonio Franques

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Education

- **University of Illinois at Urbana-Champaign** — Urbana, IL
  Ph.D. in Computer Science – Advisor: Prof. Josep Torrellas — *Aug. 2021*
  M.S. in Computer Science — *Dec. 2019*
  - **Relevant coursework**: Parallel Computer Architectures; Operating Systems Design; Machine Learning for Signal Processing; Designing Applications for Extreme Scale Systems (MPI+OpenMP)
- **Polytechnic University of Valencia** — Valencia, Spain
  B.S. in Telecommunications Engineering – Class Rank: 2nd — *Jun. 2015*

Industry & Research Experience

- **Apple Inc.** — Cupertino, CA
  SoC Performance Architect — *Aug. 2021 – Present*
  - On-chip interconnect modeling and quality of service
- **AMD Research** — Bellevue, WA and Austin, TX
  Co-Op Engineer – Software Development — *Sep. 2018 – May 2019*
  - Developed and benchmarked driver and library software (C/C++, Libfabric, GDB) to evaluate the capabilities and performance of prototype interconnects for exascale computing in virtual (QEMU) and real environments
  - Co-authored a U.S. patent for hybrid interconnect technologies (App. No. 16/588,612)
- **I-ACOMA Group** — University of Illinois at Urbana-Champaign, Urbana, IL
  Graduate Research Assistant — *Aug. 2015 – Aug. 2021*
  - **Area**: Computer Architecture, Parallel Computing, and Systems
  - Worked on HW-SW co-designs for novel highly-scalable shared-memory chip multiprocessors, leveraging on-chip wireless communication to reduce the large cost of core-to-core communication in parallel computing. Evaluated performance using Gem5+SST+Multi2Sim, and energy consumption with McPAT+Cacti
- **DAMRES Numerical Analysis Lab** — Polytechnic University of Valencia, Valencia, Spain
  Undergraduate Research Assistant — *Sep. 2013 – Jul. 2015*
  - **Area**: Computational Mathematics
  - Designed new set of highly efficient and stable iterative methods for solving nonlinear equations and systems. Applied and analyzed these methods using Matlab to Bratu's problem and Burgers' equation (used in Physics)

Select Publications

- **A. Franques**, A. Kokolis, S. Abadal, V. Fernando, S. Misailovic, J. Torrellas. *"WiDir: A Wireless-Enabled Directory Cache Coherence Protocol"*. International Symposium on High-Performance Computer Architecture **(HPCA)**, 2021.
- **A. Franques**, S. Abadal, H. Hassanieh, J. Torrellas. *"Fuzzy-Token: An Adaptive MAC Protocol for Wireless-Enabled Manycores"*. Design, Automation & Test in Europe Conference **(DATE)**, 2021.
- V. Fernando, **A. Franques**, S. Abadal, S. Misailovic, J. Torrellas. *"Replica: A Wireless Manycore for Communication-Intensive and Approximate Data"*. International Conference on Architectural Support for Programming Languages and Operating Systems **(ASPLOS)**, 2019.

Select Class & Personal Projects

- **Automatic MAC Protocol Selection in Wireless-Enabled Manycore Chips**: application of machine learning techniques to infer the optimal medium access control protocol per epoch from real-time processor and memory traces. Implemented in Python. Achieved accuracy of 96%. Evaluated performance on Splash-2 and Crono suites
- **Lazarius**: Android app (Java) for helping reduced-vision people move around cities in real time. Used Google Maps API together with Valencia City Council's Open Data for accessibility and public transport

Skills

- **Programming Languages**: C/C++, Python, Java, Matlab, PHP, Javascript, SQL
- **Frameworks & Tools**: Gem5, SST, Multi2Sim, McPAT+Cacti, MPI, CUDA, Mathematica, Git, Matplotlib, LaTeX