

Lois Orosa

Scientific Director & Senior Researcher

Galicia Supercomputing Center (CESGA) • Spain

🌐 <https://loisorosa.github.io> ✉ lorosa@cesga.es

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Research Interests

Computer Architecture, Memory Systems, Hardware Security and Reliability, Data Centric Computing, New Memory Technologies, AI Hardware-Software Co-design, Storage Systems, Parallel Systems, Quantum Computing Reliability and Security.

Director Positions

- **Scientific Director** **Galicia Supercomputing Center (CESGA), Spain**
Director *September 2025 - now*
 - Scientific Director
 - Designing a Scientific Strategy for scaling the institution
 - Institutional representative
 - Get and lead the European AI Factory 1HealthAI (82M EUR)
 - **Managing Director** **Galicia Supercomputing Center (CESGA), Spain**
Director *March 2022 - September 2025*
 - Leading CESGA's strategic change.
 - Contributing to attract large European Funds for infrastructure, services and research.
 - CESGA Representative in the Galicia Quantum Technology Hub (2022-2030, 154M EUR)
 - Quantum Computer with more Qubits in South Europe (2023, 32 Qubits, 14M EUR)
 - Second largest Supercomputer in Spain (Finisterrae III, 2022, 7M EUR)
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Academia

- **Senior Researcher** **Galicia Supercomputing Center (CESGA), Spain**
Senior Researcher *September 2025 - now*
 - Main goal: Design Reliable, secure and efficient computing systems for AI and other emerging applications
 - Ramón y Cajal tenure track contract (ranked 1st with a score of 100/100)
 - Leading a Consolidación Investigadora project (199.927 EUR.)
 - Xunta the Galicia Consolidator Grant (115.000 EUR.)
 - Leading the Experimental platform of the 1HealthAI AI Factory (4M EUR.)
- **Senior Researcher** **ETH Zürich, Switzerland**
Department of Information Technology and Electrical Engineering (D-ITET) *January 2019 - March 2022*
 - Group PI: Onur Mutlu.
- **PostDoctoral Fellow** **University of Campinas (UNICAMP), Brazil**
Computer Systems Laboratory (LSC) *June 2014 - July 2018*
 - Architectural Support for Speculative Program Execution.
 - Supported by FAPESP grant 2014/03840-2.
 - Group PI: Rodolfo Azevedo.
- **Academic Guest** **ETH Zürich, Switzerland**
Department of Computer Science, Systems Group *January 2017 - January 2018*
 - Enabling security features in commodity DRAM chips.
 - Supported by FAPESP grant 2016/18929-4.

- Supervisor: Onur Mutlu.
 - **PostDoctoral Researcher** **University of Santiago de Compostela, Spain**
CiTIUS *January 2014 – May 2014*
 - Supervisors: Elisardo Antelo and Javier Bruguera.
 - **PostDoctoral Researcher** **Universidade Nova de Lisboa, Portugal**
Computer Science Department *September 2013 – December 2013*
 - Hardware support for detecting atomicity violations.
 - Supported by European Cooperation in Science and Technology (COST) with a Short-term Scientific Mission (STSM).
 - Supervisor: João Lourenço.
 - **Phd Student** **University of Santiago de Compostela, Spain**
Department of Electronics and Computer Science - Computer Architecture group *2008 – September 2013*
 - Thesis title: "New Hardware Support for Transactional Memory and Parallel Debugging in Multicore Processors"
 - Supported by the project "Hardware and software support for high performance computing" (TIN2010-17541).
 - Advisors: Elisardo Antelo Suárez and Javier Díaz Bruguera.
 - **Phd Courses** **University of Santiago de Compostela, Spain**
Department of Electronics and Computer Science *September 2008 – June 2010*
 - Interuniversity PhD in Information Technology (University of Santiago de Compostela and University of Coruña)
 - **Scholarship** **University of Illinois at Urbana-Champaign, U.S.A.**
Department of Computer Science - IACOMA group *September 2009 – December 2009*
 - Research topic: Tolerating concurrency bugs in multicore processors.
 - Advisor: Josep Torrellas
 - **M.Eng** **University of Vigo, Spain**
Telecommunications Engineering *2000 – 2005*
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Industry Experience

- **Xilinx Research** **Dublin, Ireland**
Internship *July 2018 – December 2018*
 - Research on Training Convolutional Neural Networks (CNNs)
 - Mentor: Michaela Blott
- **Recore Systems** **Enschede, Netherlands**
Internship *August 2012 – December 2012*
 - Development of a shared memory multicore simulator.
 - Mentor: Gerard Rauwerda
- **IBM R&D Labs** **Haifa, Israel**
Summer internship *July 2010 – October 2010*
 - Development of compiler-based deterministic replay for X10 Language.
 - Mentors: Olga Golovanevsky, Marina Biberstein, Bilha Mendelson.
- **ARANTIA 2010 (Televes group)** **Santiago de Compostela, Spain**
R&D engineer *November 2006 – January 2008*
 - Development of network multimedia applications (TV streaming, multimedia contents).
- **Communitel Global S.A. (Vodafone)** **Vigo, Spain**
Engineer *April 2006 – November 2006*

- Resolve second level maintenance issues, and automatize large-scale production tasks with perl and C.

● **Communitel Global S.A. (Vodafone)**
Engineer

Vigo, Spain

July 2005 – October 2005

- Development of WebServices.

Published Papers

Conference Papers

- João Dinis Ferreira, Gabriel Falcao, Juan Gómez-Luna, Mohammed Alser, **Lois Orosa**, Mohammad Sadrosadati, Jeremie S Kim, Geraldo F Oliveira, Taha Shahroodi, Anant Nori, Onur Mutlu, "pLUTo: Enabling massively parallel computation in DRAM via lookup tables", 55th IEEE/ACM International Symposium on Microarchitecture (MICRO'22)
- Giray Yağlıkçı, Ataberk Olgun, Minesh Patel, Haocong Luo, Hasan Hassan, **Lois Orosa**, Oğuz Ergin, Onur Mutlu, "HiRA: Hidden Row Activation for Reducing Refresh Latency of Off-the-Shelf DRAM Chips", 55th IEEE/ACM International Symposium on Microarchitecture (MICRO'22)
- Giray Yağlıkçı, Haocong Luo, Geraldo F De Oliviera, Ataberk Olgun, Minesh Patel, Jisung Park, Hasan Hassan, Jeremie S Kim, **Lois Orosa**, Onur Mutlu, "Understanding RowHammer Under Reduced Wordline Voltage: An Experimental Study Using Real DRAM Devices", 52nd Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN'22)
- F. Nisa Bostancı, Ataberk Olgun, **Lois Orosa**, A. Giray Yağlıkçı, Jeremie S. Kim, Hasan Hassan, Oğuz Ergin, Onur Mutlu, "DR-STRaNGe: End-to-End System Design for DRAM-based True Random Number Generators", 28th IEEE International Symposium on High-Performance Computer Architecture (HPCA'22)
- **Lois Orosa**, Abdullah Giray Yağlıkçı, Haocong Luo, Ataberk Olgun, Jisung Park, Hasan Hassan, Minesh Patel, Jeremie Kim, Onur Mutlu, "A Deeper Look into RowHammer's Sensitivities: Experimental Analysis of Real Chips and Implications on Future Attacks and Defenses", 54th IEEE/ACM International Symposium on Microarchitecture (MICRO'21)
- Geraldo F. Oliveira, Juan Gómez-Luna, **Lois Orosa**, Saugata Ghose, Nandita Vijaykumar, Ivan Fernandez, Mohammad Sadrosadati, Onur Mutlu, "DAMOV: A New Methodology and Benchmark Suite for Evaluating Data Movement Bottlenecks", IEEE ACCESS, 2021
- **Lois Orosa**, Yaohua Wang, Mohammad Sadrosadati, Jeremie S. Kim, Minesh Patel, Ivan Puddu, Haocong Luo, Kaveh Razavi, Juan Gómez-Luna, Hasan Hassan, Nika Mansouri-Ghiasi, Saugata Ghose, Onur Mutlu, "CODIC: A Low-Cost Substrate for Enabling Custom In-DRAM Functionalities and Optimizations", 48th IEEE International Symposium on Computer Architecture (ISCA'21)
- Jawad Haj-Yahya, Jeremie Kim, Ivan Puddu, Abdullah Giray Yağlıkçı, Mohammed Alser, **Lois Orosa**, Juan Gómez-Luna, Onur Mutlu, "IChannels: Exploiting Current Management Mechanisms to Create Covert Channels in Modern Processors", 48th IEEE International Symposium on Computer Architecture (ISCA'21)
- Jisung Park, Myungsuk Kim, Myoungjun Chun, **Lois Orosa**, Jihong Kim, Onur Mutlu, "Reducing Solid-state Drive Read Latency by Optimizing Read-retry", 26th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'21)
- Christina Giannoula, Nandita Vijaykumar, Nikela Papadopoulou, Vasileios Karakostas, Ivan Fernandez, Juan Gómez-Luna, **Lois Orosa**, Nectarios Koziris, Georgios Goumas, Onur Mutlu, "SynCron: Enabling Efficient Synchronization Support for Near-Data-Processing Architectures", 27th IEEE International Symposium on High-Performance Computer Architecture (HPCA'21)
- Abdullah Giray Yağlıkçı, Minesh Patel, Jeremie Kim, Roknoddin AziziBarzoki, Jisung Park, Hasan Hassan, Ataberk Olgun, **Lois Orosa**, Konstantinos Kanellopoulos, Taha Shahroodi, Saugata Ghose, Onur Mutlu, "BlockHammer: Preventing RowHammer at Low Cost by Blacklisting Rapidly-Accessed DRAM Rows", 27th IEEE International Symposium on High-Performance Computer Architecture (HPCA'21)

- Jawad Haj-Yihia, Mohammed Alser, **Lois Orosa**, Jeremie Kim, Efraim Rotem, Avi Mendelson, Anupam Chattopadhyay, Onur Mutlu, "A Power- and Workload-Aware Hybrid Power Delivery Network for Energy-Efficient High-end Client Processors", 53rd IEEE/ACM International Symposium on Microarchitecture (MICRO'20)
- Yaohua Wang, **Lois Orosa**, Xiangjun Peng, Yang Guo, Saugata Ghose, Minesh Patel, Jeremie Kim, Juan Gómez-Luna, Mohammad Sadrosadati, Nika Mansouri Ghiasi, Onur Mutlu, "Reducing DRAM Latency via Fine-grained In-DRAM Cache", 53rd IEEE/ACM International Symposium on Microarchitecture (MICRO'20)
- Leonid Yavits, **Lois Orosa**, Suyash Mahar, João Dinis Ferreira, Ran Ginosar, Onur Mutlu, Mattan Erez, "WoL-FRAM: Enhancing Wear-Leveling and Fault Tolerance in Resistive Memories Using Programmable Address Decoders", 38th IEEE International Conference on Computer Design (ICCD'20)
- Jorge Gonzalez, Alexander Gazman, Maarten Hattink, Mauricio G. Palma, Meisam Bahadori, Ruth Rubio-Noriega, **Lois Orosa**, Madeleine Glick, Onur Mutlu, Keren Bergman, and Rodolfo Azevedo, "Optically Connected Memory for Disaggregated Data Centers", 32nd International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD'20)
- Jeremie Kim, Minesh Patel, Abdullah Giray Yağlıkçı, Hasan Hassan, Roknoddin Azizi, **Lois Orosa**, and Onur Mutlu, "Revisiting RowHammer: An Experimental Analysis of Modern DRAM Devices and Mitigation Techniques", 47th Annual International Symposium on Computer Architecture (ISCA'20)
- Haocong Luo, Taha Shahroodi, Hasan Hassan, Minesh Patel, Abdullah Giray Yağlıkçı, **Lois Orosa**, Jisung Park, and Onur Mutlu, "CLR-DRAM: A Low-Cost DRAM Architecture Enabling Dynamic Capacity-Latency Trade-Off", 47th Annual International Symposium on Computer Architecture (ISCA'20)
- Myungsuk Kim, Jisung Park, Genhee Cho, Yoona Kim, **Lois Orosa**, Onur Mutlu, and Jihong Kim, "Evanesco: Architectural Support for Efficient Data Sanitization in Modern Flash-Based Storage Systems", 25th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS'20)
- Skanda Koppula, **Lois Orosa**, Giray Yağlıkçı, Roknoddin Azizi, Taha Shahroodi, Konstantinos Kanellopoulos, and Onur Mutlu, "EDEN: Enabling Energy-Efficient, High-Performance Deep Neural Network Inference Using Approximate DRAM", 52nd Annual IEEE/ACM International Symposium on Microarchitecture (MICRO'19)
- Jeremie S. Kim, Minesh Patel, Hasan Hassan, **Lois Orosa** and Onur Mutlu, "D-RaNGe: Using Commodity DRAM Devices to Generate True Random Numbers with Low Latency and High Throughput", 25th IEEE International Symposium on High-Performance Computer Architecture (HPCA'19)
- Yaohua Wang, Arash Tavakkol, **Lois Orosa**, Saugata Ghose, Nika Mansouri Ghiasi, Minesh Patel, Jeremie Kim, Hasan Hassan and Onur Mutlu, "Reducing DRAM Latency via Charge-Level-Aware Look-Ahead Partial Restoration", 51st Annual IEEE/ACM International Symposium on Microarchitecture (MICRO'18).
- Arash Tavakkol, Mohammad Sadrosadati, Saugata Ghose, Jeremie Kim, Yixin Luo, Yaohua Wang, Nika Mansouri Ghiasi, **Lois Orosa**, Juan Gomez-Luna and Onur Mutlu, "FLIN: Enabling Fairness and Enhancing Performance in Modern NVMe Solid State Drives", 45th International Symposium on Computer Architecture (ISCA'18), Los Angeles, 2018, pp. 397-410.
- Jorge Gonzalez, **Lois Orosa** and Rodolfo Azevedo, "Architecting a computer with a full optical RAM," 23rd IEEE International Conference on Electronics, Circuits and Systems (ICECS'16), Monte Carlo, 2016, pp. 716-719.
- **Lois Orosa** and Rodolfo Azevedo, "Temporal frequent value locality," 27th IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP'16), London, 2016, pp. 147-152.
- **Lois Orosa** and João Lourenço, "A Hardware Approach for Detecting, Exposing and Tolerating High Level Atomicity Violations", 24th Euromicro International Conference on Parallel, Distributed, and Network-Based Processing (PDP'16), Heraklion, 2016, pp. 159-167.
- Shanxiang Qi, Norimasa Otsuki, **Lois Orosa**, Abdullah Muzahid, and Josep Torrellas, "Pacman: Tolerating Asymmetric Data Races with Unintrusive Hardware", 18th International Symposium on High Performance Computer Architecture (HPCA'12), New Orleans, Louisiana, 2012, pp. 1-12.
- **Lois Orosa**, J.D. Bruguera and E. Antelo, "A Cache Filtering Mechanism for Hardware Transactional Memory Systems Decoupled from Caches", XX Jornadas de Paralelismo, A Coruña (Spain), 2009.

Journals

- **Lois Orosa**, Ulrich Rührmair, A. Giray Yağlıkçı, Haocong Luo, Ataberk Olgun, Patrick Jattke, Minesh Patel, Jeremie Kim, Kaveh Razavi, and Onur Mutlu. "SpyHammer: Understanding and Exploiting RowHammer under Fine-Grained Temperature Variations", *IEEE ACCESS*, 2024.
- **Lois Orosa**, Skanda Koppula, Yaman Umuroglu, Konstantinos Kanellopoulos, Juan Gómez-Luna, Michaela Blott, Kees Vissers, and Onur Mutlu. "Efficient Convolutional Dataflows on Low-Power Neural Network Accelerators", *IEEE Transactions on Computers (TC)*, 2023.
- Olgun, Ataberk, Hasan Hassan, A. Giray Yağlıkçı, Yahya Can Tuğrul, **Lois Orosa**, Haocong Luo, Minesh Patel, Oğuz Ergin, and Onur Mutlu. "DRAM Bender: An Extensible and Versatile FPGA-based Infrastructure to Easily Test State-of-the-art DRAM Chips", *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2023.
- Nika Mansouri Ghiasi, Nandita Vijaykumar, Geraldo Oliveira, **Lois Orosa**, Ivan Fernandez, Mohammad Sadrosadati, Konstantinos Kanellopoulos, Nastaran Hajinazar, Juan Gómez Luna, Onur Mutlu, "ALP: Alleviating CPU-Memory Data Movement Overheads in Memory-Centric Systems", *IEEE Transactions on Emerging Topics in Computing*, 2022
- Jorge Gonzalez, Mauricio Palma, Maarten Hattink, Ruth Rubio-Noriega, **Lois Orosa**, Onur Mutlu, Keren Bergman, Rodolfo Azevedo, "Optically Connected Memory for Disaggregated Data Centers", *Journal of Parallel and Distributed Computing*, 2022
- Muhammad Shafique, Mahum Naseer, Theocharis Theocharides, Christos Kyrkou, Onur Mutlu, **Lois Orosa**, Jungwook Choi, "Robust Machine Learning Systems: Challenges, Current Trends, Perspectives, and the Road Ahead", *IEEE Design & Test*, 2020
- **Lois Orosa**, Rodolfo Azevedo and Onur Mutlu, "AVPP: Address-first Value-next Predictor with Value Prefetching for Improving the Efficiency of Load Value Prediction", *ACM Transactions on Architecture and Code Optimization (TACO)*, 2018.
- Mohammad Sadrosadati, Borna Ehsani, Hajar Falahati, Rachata Ausavarungnirun, Arash Tavakkol, Mojtaba Abaei, **Lois Orosa**, Yaohua Wang, Hamid Sarbazi-Azad and Onur Mutlu, "ITAP: Idle-Time-Aware Power Management Technique for GPU Execution Units", *ACM Transactions on Architecture and Code Optimization (TACO)*, 2018.
- **Lois Orosa**, J.D. Bruguera and E. Antelo, "Asymmetric Allocation in a Flexible Signature Module for Multicore Processors", *The Computer Journal*, Oct. 2016, vol. 59, no. 10, pp. 1453-1469.
- **Lois Orosa**, E. Antelo and J.D. Bruguera, "FlexSig: Implementing Flexible Hardware Signatures", *ACM Transactions on Architecture and Code Optimization (TACO)*, January 2012, Volume 8 Issue 4.

Book Chapters

- **Lois Orosa**, Skanda Koppula, Konstantinos Kanellopoulos, A Giray Yağlıkçı, and Onur Mutlu, "Using Approximate DRAM for Enabling Energy-Efficient, High-Performance Deep Neural Network Inference", in *Embedded Machine Learning for Cyber-Physical, IoT, and Edge Computing: Hardware Architectures*, chapter 10, pages 275-314. Springer.

Workshops (refereed)

- **Lois Orosa** and Rodolfo Azevedo, "LogSI-HTM: Log Based Snapshot Isolation in Hardware Transactional Memory", 7th Workshop on the Theory of Transactional Memory (WTTM 2015), July 20th, 2015, Donostia-San Sebastián, Spain - in conjunction with PODC 2015.
- **Lois Orosa** and João Lourenço, "A Hardware Approach for Detecting, Exposing and Tolerating High Level Atomicity Violations", Workshop on Dependable Multicore and Transactional Memory Systems (DMTM), January 22nd, 2014, Vienna, Austria

Posters

- **Lois Orosa**, Yaohua Wang, Mohammad Sadrosadati, Jeremie S. Kim, Minesh Patel, Ivan Puddu, Haocong Luo, Kaveh Razavi, Juan Gómez-Luna, Hasan Hassan, Nika Mansouri-Ghiasi, Saugata Ghose, Onur Mutlu, "CODIC: A Low-Cost Substrate for Enabling Custom In-DRAM Functionalities and Optimizations", 49th IEEE International Symposium on Computer Architecture (ISCA'22), June 18-22 2022, New York, USA.
 - **Lois Orosa**, Yaohua Wang, Ivan Puddu, Mohammad Sadrosadati, Hasan Hassan, Arash Tavakkol, Nika Mansouri Ghiasi, Minesh Patel, Jeremie Kim, Juan Gomez-Luna, Vivek Seshadri, Rodolfo Azevedo and Onur Mutlu, "Dataplant: A Low-Cost In-DRAM Value Generation Primitive for Enabling System Security Features", ETH Systems Group Industry Retreat, January 22-24, 2018, Engelberg, Switzerland.
 - Mohammad Sadrosadati, Amirhossein Mirhosseini, Borna Ehsani, Rachata Ausavarungnirun, Arash Tavakkol, Hajar Falahati, **Lois Orosa**, Yaohua Wang, Hamid Sarbazi-Azad, Babak Falsafi and Onur Mutlu, "Improving GPU Power and Energy Efficiency", ETH Systems Group Industry Retreat, January 22-24, 2018, Engelberg, Switzerland.
 - Juan Gómez-Luna, Arash Tavakkol, Amirali Boroumand, Geraldo Francisco de Oliveira Junior, Mert Atamaner, Mohammad Sadrosadati, Nika Mansouri Ghiasi, **Lois Orosa** and Onur Mutlu, "Processing-In-Memory Benchmark Suite and Analysis", ETH Systems Group Industry Retreat, January 22-24, 2018, Engelberg, Switzerland.
 - **Lois Orosa**, Yaohua Wang, Ivan Puddu, Mohammad Sadrosadati, Hasan Hassan, Arash Tavakkol, Minesh Patel, Vivek Seshadri, Rodolfo Azevedo and Onur Mutlu, "A Case for an Amnesic DRAM Chip", ETH Industry day, Zurich, Switzerland, 29 August 2017.
 - **Lois Orosa**, Rodolfo Azevedo and Onur Mutlu, "AVPP: Address-first Value-next Predictor with Value Prefetching", ETH Systems Group Industry Retreat, January 30 - February 1, 2017, Engelberg, Switzerland.
 - **Lois Orosa**, E. Antelo and J.D. Bruguera, "FlexSig: Implementing Flexible Hardware Signatures", 7th HiPEAC Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC'12), January 23-25, 2012, Paris, France
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Master Thesis

- Title: "Hardware to Improve the Parallel Programming Support on CMPs"
 - Department of Electronics and Computer Science, University of Santiago de Compostela, July 2010
 - Advisors: Javier D. Bruguera and Elisardo Antelo
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Undergraduate Thesis

- Title: "Design and Development of an Interface to Access and Remotely Control a QoS Parameter Measurement Device in VoIP networks"
 - Telecommunications Engineering School, University of Vigo, April 2006
 - Advisor: J. Carlos López Ardao. In collaboration with Comunitel Global S.A. (Vodafone)
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(Invited) Scientific Talks

- "Computer Architecture Research in the Galicia Supercomputing Center: Challenges and Opportunities", 1st SAFARI Conference, December 15th, 2025, Global Online event. [\[Talk\]](#)
- "CODIC: A Low-Cost Substrate for Enabling Custom In-DRAM Functionalities and Optimizations", SAFARI Seminar, February 10th, 2022, Global Online event. [\[Talk\]](#)
- "A Deeper Look into RowHammer's Sensitivities: Experimental Analysis of Real DRAM Chips and Implications on Future Attacks and Defenses", SAFARI P&S SoftMC 2022 Spring Semester, October 18th, 2022. [\[Talk\]](#)

- "A Deeper Look into RowHammer's Sensitivities: Experimental Analysis of Real DRAM Chips and Implications on Future Attacks and Defenses", 54th IEEE International Symposium on Microarchitecture, October 21th, 2021, Global Online event
- "CODIC: A Low-Cost Substrate for Enabling Custom In-DRAM Functionalities and Optimizations", 48th IEEE International Symposium on Computer Architecture, June 15th, 2021, Global Online event [[Short Talk](#)] [[Long Talk](#)]
- "FIGARO: Improving System Performance via Fine-grained in-DRAM Data Relocation and Caching", 53th IEEE/ACM International Symposium on Microarchitecture, October 19th, 2020, Global Online event [[Short Talk](#)] [[Long Talk](#)]
- "More Capable and Efficient DRAM Main Memory Designs", Swiss Joint Research Center Workshop, École Polytechnique Fédérale de Lausanne (EPFL), January 30, 2020
- "EDEN: Enabling Energy-Efficient, High-Performance Deep Neural Network Inference Using Approximate DRAM", Computer Architecture Course (263-2210-00L), ETH Zurich, October 24th, 2019 [[Talk](#)]
- "AVPP: Address-first Value-next Predictor with Value Prefetching for Improving the Efficiency of Load Value Prediction", 14th HiPEAC Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC'19), January 22th, 2019, Valencia, Spain. .
- "ITAP: Idle-Time-Aware Power Management for GPU Execution Units", 14th HiPEAC Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC'19), January 23th, 2019, Valencia, Spain..
- "Temporal Frequent Value Locality", 27th Annual IEEE International Conference on Application-specific Systems, Architectures and Processors (ASAP'16), July 6th, 2016, London, England.
- "Detecting, Exposing and Tolerating High Level Data Races", 2nd Manycore Workshop on Micro architectural Challenges in Performance, Energy Efficiency and Resilience, March 15th, 2016, Campinas, Brazil.
- "A Hardware Approach for Detecting, Exposing and Tolerating High Level Atomicity Violations", 24th Euromicro International Conference on Parallel, Distributed, and Network-Based Processing (PDP'16), February 19th, 2016, Heraklion, Greece.
- "Revisiting Load Value Speculation", Seminar series, April 17th, 2015, University of Campinas, Brazil.
- "Revisiting Load Value Speculation", Research Meeting: Performance, Energy and Reliability Challenges in Multi- and Many-core Platforms, March 19th, 2015, Porto Alegre, Brazil.
- "A Hardware Approach for Detecting, Exposing and Tolerating High Level Atomicity Violations", Workshop on Dependable Multicore and Transactional Memory Systems (DMTM), January 22nd, 2014, Vienna, Austria.
- "FlexSig: Implementing Flexible Hardware Signatures", 7th HiPEAC Conference on High-Performance and Embedded Architectures and Compilers (HiPEAC'12), January 23th, 2012, Paris, France.
- "A Cache Filtering Mechanism for Hardware Transactional Memory Systems Decoupled from Caches", XX Jornadas de Paralelismo, A Coruña (Spain), 2009.
- "Introduction to microprocessors and microcontrollers", XCARFOS Summer course (Days of automatic control and robotics with open source tools), July 2009

Divuligation Talks, Interviews and Institutional Achievements (Uncomplete)

- Round table and talk "Galicia's Quantum Strategy, Projects and Infrastructures", at Italy-Spain bilateral Meeting on Quantum Technologies, Madrid (Italian Embassy and Blas Cabrera Institute), April 20-21, 2026.
- Talk "Centro de Supercomputación de Galicia (CESGA): Unha oportunidade para o ecosistema de I+D+i de Galicia", TTick Talks (Atlantic, UVIGO), April 10, 2026
- Talk "1HealthAI: Factoría Europea de IA para Unha Soa Saúde", Cátedra Camelia (CiTIUS), April 9, 2026
- Talk "Centro de Supercomputación de Galicia (CESGA)", visit of Óscar López, Ministry of Digital Transformation of Spain, April 9, 2026

- Talk "1HealthAI: a intelixencia artificial ao servizo da saúde, da biotecnoloxía e da transformación do coñecemento", acto de entrega dos Premios de Investigación en Saúde Transfronteiriza Galicia–Norte de Portugal (PISGa), February 4, 2026
- Round Table "Infraestruturas e datos abertos (CESGA e DEUCALION)", II Encontro Luso-Galaico de PLN, Santiago de Compostela, March 13, 2026
- "O IGFAE e o CESGA impulsan o Quantum Computing Lab", IGFAE (USC), January 14, 2026. [News]
- "La UVigo albergará un nuevo laboratorio de computación cuántica óptica de vanguardia (VQCC-CESGA Quantum Optical Computing Lab)", Radio Vigo (Cadena SER), January 15, 2026. [Cadena SER] [Europa Press] [GCiencia]
- "Lois Orosa, director del Cesga, sobre la nueva fábrica de IA: *Va a ser una puerta a Europa*", Economía Digital Galicia, December 23, 2025. [Interview]
- "Lois Orosa, director do CESGA: *A factoría de IA é unha porta a Europa dende Santiago*", COPE Galicia, October 23, 2025. [Interview]
- "¿Por qué la factoría europea de IA convertirá a Galicia en referente mundial en innovación en salud?", La Voz de Galicia, October 11, 2025. [La Voz de Galicia]
- "Galicia logra un *hito histórico* al poner en marcha la línea de comunicación cuántica más larga de España", esRadio (Libertad Digital), October 9, 2025. [esRadio]
- "Europa quiere ganar soberanía con la inteligencia artificial en Galicia con una fábrica pionera", COPE (La Linterna), October 15, 2025. [Interview]
- "Así será la nueva sede del Cesga en A Sionlla: las obras arrancarán en octubre", El Correo Gallego, August 13, 2025. [El Correo Gallego]
- "Galicia enciende el computador cuántico más potente de España", La Voz de Galicia, July 4, 2025. [La Voz de Galicia]
- "Qmio, el supercomputador cuántico que consolida la *posición estratégica* del I+D+i gallego", El Correo Gallego, May 26, 2025. [El Correo Gallego]
- "El sector biotech gallego confía en el Cesga para acelerar el descubrimiento de fármacos", La Voz de Galicia, April 16, 2025. [La Voz de Galicia]
- "El ecosistema biotech gallego afianza su apuesta para que la computación de altas prestaciones del Cesga reduzca costes y acelere el descubrimiento de fármacos", Bioga, April 15, 2025. [News]
- "Lois Orosa en *De 0 a 100*: *Ö maior valor do Cesga é o apoio à comunidade científica*", La Voz de Asturias, December 5, 2024. [Interview]
- "Hablan las protagonistas del mural de Yoseba MP que une superabuelas y computación cuántica...", La Voz de Galicia, November 30, 2024. [La Voz de Galicia]
- "La Xunta aprobará el lunes la licitación de la obra de la nueva sede del Cesga en A Sionlla", La Voz de Galicia, October 19, 2024. [La Voz de Galicia]
- "La Xunta asegura que la nueva sede del Centro de Supercomputación situará Galicia *a la vanguardia* en Europa", Galicia Press (Europa Press), October 18, 2024. [News]
- "Jornada de Usuarios 2024", CESGA, June 6, 2024. [Event]
- "CESGA, unha Infraestrutura na Vangarda da Computación Europea", Os luns no Ateneo, Santiago de Compostela, December 18, 2023. [Talk]
- "Galicia por Diante Fin de Semana (by Ángel Suánzes)", Regional radio (RTVG), Lois Orosa (CESGA), Ignacio López (CESGA), November 19, 2023. [Interview]
- "CESGA in the Quantum Computing Era", at Corunna Innovate Summit, Coruña, October 27, 2023. [Talk to be released]

- "Interview for Sois los primeros", esRadio, October 22, 2023. [[esRadio \(schedule\)](#)] [[Program page](#)]
- "El Correo Gallego mesa redonda FUTURIBLES", Manuel Ángel Alonso (Telefónica), María Antonia Otero (expert in the technology sector), Lois Orosa (CESGA), Santiago de Compostela, October 19, 2023. [[El Correo Gallego](#)]
- "Interview for TVG", Galicia Regional Television (TVG), October 14, 2023. [[Interview](#)]
- "Reportaxe TVG", Galicia Regional Television (TVG), October 4, 2023. [[Talk](#)]
- "QMIO Report", CESGA, October 3, 2023. [[20Minutos](#)]
- "QMIO Premiere", CESGA, October 2, 2023. [[Video](#)] [[La Voz de Galicia](#)] [[Computer World](#)] [[YouTube playlist](#)]
- "Galicia Quantum Technologies Hub: Presentation Act", Santiago de Compostela, July 15, 2022. [[Talk](#)] [[YouTube playlist](#)]
- "Fujitsu-CESGA Collaboration Agreement", CESGA, April 21, 2023. [[Video](#)]
- "Quantum Computing Report", GCiencia, March 20, 2023. [[GCiencia](#)]
- "Finisterrae III Report", El País, October 14, 2022. [[El Pais](#)]
- "Finisterrae III Interview", Lois Orosa (CESGA) and Chema Martell (CSIC), A Golpe de Bit (RTVE), October 3, 2022. [[RTVE](#)]
- "Finisterrae III Premiere", CESGA, May 20, 2022.
- "Interview for Radio Galega", Galicia Regional Radio (RTVG), March 10, 2022. [[Interview](#)]
- "El compostelano Lois Orosa será el nuevo director del Centro de Supercomputación de Galicia", El Correo Gallego, February 24, 2022. [[El Correo Gallego](#)]

Projects, Grants and Awards

- PI of the 1HealthAI Factory, granted to CESGA **82.000.000 EUR**.
- PI of the Experimental Platform (as part of the 1Health AI Factory). Build reliable, secure and efficient computer systems for AI, and building Quantum Computing systems **4.000.000 EUR**.
- IN607D 2025/12, PI in the Axudas do Programa de Consolidación e Estructuración de Unidades de Investigación Competitivas, 2025, with the project "Memorias e sistemas de computación eficientes e seguros", 2025 call, **115.000 EUR**.
- CNS2024-154583, PI in the Consolidación Investigadora Project "DRAM Security in High Performance Computing Systems", 2024 call, **199.927 EUR**.
- RYC2023-045785-I, Ramón y Cajal Tenure Track Contract: ranked 1st in "Information and Communication Technologies" area, in the 2023 call. Title: "More Capable, Secure and Efficient DRAM Main Memory Designs and Computer Architectures"**Score: 100/100, 251.800 EUR**.
- R3 certificate (established researcher): certificate given to researchers who have developed a level of independence. **Score: 96/100**.
- Researcher in the project "Memory System Design for AI/ML Accelerators & ML/AI Techniques for Memory System Design", Semiconductor Research Corporation (SRC), Task 2946.001, 1 year, **100.000 CHF**
- FAPESP 2016/18929-4, Speculative Techniques for Reducing the Memory Bottleneck Problem, ETH Zurich (Switzerland), 1 year, **68.735 CHF**.
- FAPESP 2014/03840-2, Architecture Support for Speculative Program Execution, University of Campinas (Brazil), 3 years, **239.990 BRL**.
- Euro-TM Short Term Scientific Mission, Universidade Nova de Lisboa, Lisbon (Portugal), 3 months, **3.500 EUR**.

- HiPEAC Industrial PhD Internship, Recore Systems, Enschede (Netherlands), 4 months, **5.000 EUR**.
- HiPEAC Industrial PhD Internship, IBM Haifa (Israel), 3 months, **5.000 EUR**.
- Researcher in the project "Hardware and software support for high performance computing" (TIN2010-17541), **185.400 EUR**.
- **19 HiPEAC paper awards.** "The HiPEAC Paper Award aims to encourage HiPEAC members to publish their work at conferences in which Europe is not strongly represented. The award is given to a HiPEAC member who presents a full paper in one of the following list of conferences: ASPLOS, DAC, FCCM, HPCA, ISCA, MICRO, PLDI, POPL"
- The paper "BlockHammer: Preventing RowHammer at Low Cost by Blacklisting Rapidly-Accessed DRAM Rows" was nominated as a finalist for the **Intel Hardware Security Academic Award 2022** (one of 4 finalists out of 34 nominations)
- The paper "Revisiting RowHammer: An Experimental Analysis of Modern DRAM Devices and Mitigation Techniques" was awarded a **Top Pick in Hardware and Embedded Security 2025**. The Top Picks award "recognizes the best of the best in hardware security" from among all hardware security papers published in the last six years, across all top security (e.g., IEEE S&P, USENIX SEC), architecture (e.g., ISCA, ASPLOS), computer-aided design (e.g., ICCAD, DAC, DATE) and hardware security (CHES) venues.

Services

Program committee member:

- The 40th ACM International Conference on Supercomputing (ICS 2026)
- The 54th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2024)
- The 53rd Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN 2023)
- Sixth Workshop on Attacks and Solutions in Hardware Security (ASHES 2022), co-located with ACM CCS 2022
- Fifth Workshop on Attacks and Solutions in Hardware Security (ASHES 2021), co-located with ACM CCS 2021

Organizing committee:

- Quantum Information in Spain 2023 (ICE-8)

Reviewer:

- Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD) [2025, 2026]
- Transactions on Dependable and Secure Computing (TDSC) 2025
- The Supercomputing Journal 2023
- Transactions on Information Forensics & Security (TIFS) 2022
- ACM Computing Surveys (CSUR) 2020
- Transactions on Architecture and Code Optimization (TACO) 2020
- IEEE MICRO [2019, 2020]
- Computers and Security 2019
- Design, Automation and Test in Europe Conference (DATE) 2019
- IEEE Transactions on Computers [2015, 2016, 2017, 2019, 2024]
- ERAD-SP 2018
- Journal of Universal Computer Science 2018

Member of the Board of Trustees:

- Galtia Foundation for attracting high-level research talent (GALTIA) [2026]

Teaching Experience

Teaching Assistant, ETH Zurich (Switzerland)

- 263-2210-00L - Computer Architecture [Falls'17, Fall'19, Fall'20, Fall'21]
- 263-2211-00L - Seminar in Computer Architecture [Spring'19, Fall'19, Spring'20, Fall'20, Spring'21, Fall'21]
- 252-0028-00L - Digital Design and Computer Architecture [Spring'19, Spring'20, Spring'21]

Lecturer, Institute of Computing, University of Campinas (Brazil)

- MC102 - Algorithms and Computer Programming (90h), Spring'16
-

PhD Students

- **Jorge Luis Gonzalez Reaño**

Thesis Title: "Photonics opportunities in modern computing systems"

– Co-advising with Rodolfo Azevedo.

University of Campinas, Brazil

2014 - 2021

Technical Skills

Programming Languages: C, C++, assembly, L^AT_EX, Perl, Python, bash

Tools: Intel Instrumentation Pin Tool, DRAM Bender, SoftMC

Simulators: Simics, GEMS, QEMU, Bochs, ZSIM, Ramulator, McPAT, DRAMPower

Languages

Galician: Native | **Spanish:** Native | **English:** C1 | **Portuguese:** Professional working proficiency