

Jaime Cernuda

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SUMMARY

PhD researcher specializing in high-performance computing infrastructure with expertise in distributed storage systems, real-time data processing, and exascale computing environments. Developed novel approaches to real-time data management and adaptive resource management for scientific computing applications. Currently advancing the intersection of HPC and artificial intelligence through agentic system architectures to address complex challenges in scientific computing. Proven track record of building HPC-scale middleware systems.

WORK EXPERIENCE

Research Assistant (Illinois Tech)

Sept. 2019 - 2025

Research Assistant in the Gnosis Research Center (GRC) at the Illinois Institute of Technology where I worked on a variety of NSF-funded projects, including Hermes, ChronoLog, and IOWarp. Managed the research of junior Ph.D. students, as well as Master students partaking in HPC and Distributed Systems classes.

Guest Lecturer (Illinois Tech)

Sept. 2023 - 2025

Guest Lecturer at the Illinois Institute of Technology for CS550: Advance Operating Systems and CS553: Cloud Computing.

Intern Computer Researcher (HDF Group)

May. 2022 - Sept. 2022

Internship at the HDF Group exploring and developing new interfaces for the HDF5 library supporting log-data semantics and in-transit computational capabilities.

Teaching Assistant (Illinois Tech)

Sept. 2019 - 2025

Teaching assistant for *Operating Systems* and *Cloud Computing*. Managed classes of 40-60 graduate students. Duties include grading and providing support for all the students queries.

Junior Software Engineer (Everis)

Sept. 2016 - July 2018

Used Blue Prism to develop two successfully deployed automation projects for multi-national companies. Joined a team of 3 people and left with 15. Helped in the education of the new members. Developed the company procedures for documentation, testing, deployment, etc. for automation projects.

EDUCATION

2019 - 2025 PhD (Computer Science) at **Illinois Institute of Technology**

2018 - 2019 Masters's Degree in Computer Science at **Illinois Institute of Technology** (GPA: 3.85/4.0)

2013 - 2019 Master's and Bachelor's Degree in Industrial Engineering (specialized in Electrical Engineering) at **Polytechnic University of Madrid** (GPA: 3.2/4.0)

PUBLICATIONS

Kougkas, Anthony et al. (2020). "ChronoLog: A Distributed Shared Tiered Log Store with Time-based Data Ordering". In: *Proceedings of the 36th International Conference on Massive Storage Systems and Technology (MSST 2020)*.

Rajesh, Neeraj et al. (2020). "Apollo: An ML-Assisted Real-Time Storage Resource Observer". In: *Proceedings of the 30th International Symposium on High-Performance Parallel and Distributed Computing*.

HPDC '21. Sweden: Association for Computing Machinery, pp. 147–159. ISBN: 9781450382175. doi: [10.1145/3431379.3460640](https://doi.org/10.1145/3431379.3460640).

Cernuda, Jaime, Hariharan Devarajan, et al. (2021). "HFlow: A Dynamic and Elastic Multi-Layered I/O Forwarder". In: *2021 IEEE International Conference on Cluster Computing (CLUSTER)*, pp. 114–124. doi: [10.1109/Cluster48925.2021.00064](https://doi.org/10.1109/Cluster48925.2021.00064).

Bateman, Keith et al. (2022). "LuxIO: Intelligent Resource Provisioning and Auto-Configuration for Storage Services". In: *2022 IEEE 29th International Conference on High Performance Computing, Data, and Analytics (HiPC)*, pp. 246–255. doi: [10.1109/HiPC56025.2022.00041](https://doi.org/10.1109/HiPC56025.2022.00041).

Logan, Luke et al. (2022). "LabStor: A Modular and Extensible Platform for Developing High-Performance, Customized I/O Stacks in Userspace". In: *SC22: International Conference for High Performance Computing, Networking, Storage and Analysis*, pp. 1–15. doi: [10.1109/SC41404.2022.00028](https://doi.org/10.1109/SC41404.2022.00028).

Cernuda, Jaime, Luke Logan, et al. (May 2024). "Hades: A Context-Aware Active Storage Framework for Accelerating Large-Scale Data Analysis". In: *The 24th IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing*. Philadelphia, pp. 577–586. doi: [DOI10.1109/CCGrid59990.2024.00070](https://doi.org/10.1109/CCGrid59990.2024.00070).

Cernuda, Jaime, Jie Ye, et al. (2024). "HStream: A hierarchical data streaming engine for high-throughput scientific applications". In: *Proceedings of the 53rd International Conference on Parallel Processing*. ICPP '24. Gotland, Sweden: Association for Computing Machinery, pp. 231–240. ISBN: 9798400717932. doi: [10.1145/3673038.3673150](https://doi.org/10.1145/3673038.3673150). URL: <https://doi.org/10.1145/3673038.3673150>.

Tang, Meng et al. (Sept. 2024). "DaYu: Optimizing Distributed Scientific Workflows by Decoding Dataflow Semantics and Dynamics". In: *Proceedings of the 2024 IEEE International Conference on Cluster Computing (CLUSTER)*. CLUSTER '24. IEEE. Kobe, Japan: Institute of Electrical and Electronics Engineers, pp. 357–369. ISBN: 979-8-3503-5871-1. doi: [10.1109/CLUSTER59578.2024.00038](https://doi.org/10.1109/CLUSTER59578.2024.00038).

Ye, Jie, Jaime Cernuda, Neeraj Rajesh, et al. (2024). "Viper: A High-Performance I/O Framework for Transparently Updating, Storing, and Transferring Deep Neural Network Models". In: *Proceedings of the 53rd International Conference on Parallel Processing*. ICPP '24. Gotland, Sweden: Association for Computing Machinery, pp. 812–821. ISBN: 9798400717932. doi: [10.1145/3673038.3673070](https://doi.org/10.1145/3673038.3673070). URL: <https://doi.org/10.1145/3673038.3673070>.

Bateman, Keith Alex et al. (2025). "DTIO: Data Stack for AI-driven Workflows". In: *Proceedings of the 37th International Conference on Scalable Scientific Data Management*. SSDBM '25. Association for Computing Machinery. ISBN: 9798400714627. doi: [10.1145/3733723.3733736](https://doi.org/10.1145/3733723.3733736). URL: <https://doi.org/10.1145/3733723.3733736>.

Ye, Jie, Jaime Cernuda, Avinash Maurya, et al. (2025). "Characterizing the Behavior and Impact of KV Caching on Transformer Inferences Under Concurrency". In: *2025 IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, pp. 1191–1202. doi: [10.1109/IPDPS64566.2025.00108](https://doi.org/10.1109/IPDPS64566.2025.00108).

SKILLS

Programming	C++, Python, Bash, C.
AI	Argentic Frameworks (Claude Code, CrewAI, A2A, etc.), Python ML stack (Scikit-Learn, NumPy, Pandas, etc).
Distributed Systems	Kafka/Pulsar, Flink, PFS (OrangeFS, Lustre), AWS, MPI.
Languages	English, Spanish, German (basic).