

ANDREA PINTO

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EDUCATION

Saint Louis University, St. Louis, MO, USA

Aug 2021 - May 2026

Ph.D. in Computer Science.

University of Naples Federico II, Naples, Italy

Oct 2020

B.S & M.S in Computer Engineering

110/110 cum laude

EXPERIENCE

Doctoral Researcher

Aug 2023 - Current

Saint Louis University, St. Louis, MO, USA

- Thesis focus: Networking Systems for Efficient Distributed Machine Learning
- Design and implementation of resources management systems focusing on scalability and utilization.
- Teaching Assistant (Computer Networks)

Full-time: CDN SRE

Feb 2026 - Current

ByteDance / TikTok

- Monitor platform performance and optimization for the networking side of the edge infrastructure (Content Delivery Network) via Machine Learning analysis and automation.

Intern: CDN SRE Performance Evaluation Engineer

May 2025 - Aug 2025

ByteDance / TikTok

- Analyze the CDN performance with advanced machine learning techniques to improve the overall performance and reduce the cost.

Intern: 5G Core System

May 2022 - Aug 2022

IMDEA Networks Institute, Madrid, Spain

- Design and implementation of Localization module compliant with 5G core technical specifications.
- Microservices oriented implementation to comply with the 5G architecture

Cloud Engineer

Jan 2021 - Jul 2021

Ericsson R&D, Naples, Italy

- Developed microservices-based architectures using Docker and Kubernetes.
- Programmed backend services in GoLang with a focus on DevOps pipelines.
- Conducted testing and validation of software components.

Intern: IoT Protocol Design Research

Feb 2020 - Aug 2020

Ericsson Research, Helsinki, Finland

- Designed IoT protocols for efficient data transmission over robotic systems.
- Implemented GraphQL and SDF models for real-time communication.
- Developed backend services using NodeJS and GRPC.

PROJECT EXPERIENCE

Datacenter Resources Orchestration [1]

- Design and validation through simulation and real testbed of network-aware allocation mechanisms to improve distributed ML training resources allocation.
- Implemented flexible and efficient distributed allocation algorithm with optimality guarantees.

- Enhanced the bandwidth bottlenecks utilization to reduce the JCT and reduce the idle GPU times.

In-Network aggregation

- Reduction of networking bottleneck during distributed training with Programmable Switches computation resources.
- Testing and implementation of P4 algorithms to maximize the bandwidth consumption in Parameter Server distributed training architectures.

Computation Offloading in Federated Learning [2]

- Designed and implemented an offloading algorithm to utilize edge resources for training purposes, scaling of IoT-constrained device training via Federated Learning.
- Implemented Deep Neural Network training with TensorFlow, demonstrating the effect of offloading part of the computation to edge resources using our Federated Split Learning (FSL) algorithm.

Localization in 5G Systems [3, 4]

- Designed and implemented Localization and Management function (LMF) compliant with 5G core design.
- Proved the efficiency of the scalability in emulations with real workload pointing out future directions for real systems deployments.

SKILLS AND COMPETENCES

Programming Languages: Python, C/C++, Java, VHDL.

Machine Learning Frameworks: TensorFlow, Keras, OpenAI Gym, PyTorch, TensorFlow.

Networking and Systems: TCP/IP, Linux Kernel Development, MPI, NCCL, NVLink, CUDA, P4, Docker, Kubernetes, git.

PUBLICATIONS

- [1] A. Pinto and F. Esposito, "Plebiscito: An architecture for distributed learning workload orchestration with guarantees," in *[UnderSubmission]*.
- [2] Z. Zhang, A. Pinto, V. Turina, F. Esposito, and I. Matta, "Privacy and efficiency of communications in federated split learning," *IEEE Transactions on Big Data*, vol. 9, no. 5, pp. 1380–1391, 2023.
- [3] A. Pinto, G. Santaromita, C. Fiandrino, D. Giustiniano, and F. Esposito, "Experimenting with localization management functions in 5g core networks," in *Proceedings of the 28th Annual International Conference on Mobile Computing And Networking*, 2022, pp. 806–807.
- [4] A. Pinto, C. Fiandrino, D. Giustiniano, and F. Esposito, "Characterizing location management function performance in 5g core networks (**Best Student Paper Award**)," in *2022 IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN)*, 2022, pp. 66–71.
- [5] A. Pinto, A. Ashdown, T. Bin Hassan, H. Cheng, F. Esposito, L. Bonati, S. D'Oro, T. Melodia, and F. Restuccia, "Hercules: An emulation-based framework for transport layer measurements over 5g wireless networks," in *Proceedings of the 17th ACM Workshop on Wireless Network Testbeds, Experimental Evaluation & Characterization*, ser. WiNTECH '23, 2023, p. 72–79.
- [6] S. Galantino, A. Pinto, F. Esposito, A. Manzalini, and F. Risso, "Balancing energy efficiency and infrastructure knowledge in cloud-to-edge task distribution systems," in *Proceedings of the 1st International Workshop on MetaOS for the Cloud-Edge-IoT Continuum*, ser. MECC '24. New York, NY, USA: Association for Computing Machinery, 2024, p. 28–34. [Online]. Available: <https://doi.org/10.1145/3642975.3678965>
- [7] A. Pinto, T. B. Hassan, F. Restuccia, and F. Esposito, "Poster: Transport-aware resource block allocation in 5g slicing," in *2024 IEEE 10th International Conference on Network Softwarization (NetSoft)*, 2024, pp. 322–323.

- [8] A. Samanta, A. Pinto, and F. Esposito, “Tireme: Performance-aware adaptive scheduling for containerized ml inference system,” in *Under submission at ICS*, 2025.
- [9] E. Paolini, A. Pinto, F. Esposito, and L. Valcarenghi, “Energy consumption of quantized federated learning in optical-wireless networks,” in *2025 25th Anniversary International Conference on Transparent Optical Networks (ICTON)*, 2025, pp. 1–4.
- [10] A. Pinto, A. Masci, A. Sacco, G. Marchetto, and F. Esposito, “Optimizing model pruning in decentralized learning networks with dfl-trim,” in *2025 IEEE 11th International Conference on Network Softwarization (NetSoft)*, 2025, pp. 189–193.
- [11] A. Sangiorgi, A. Pinto, R. Tourani, and F. Esposito, “Mitigating de-authentication dos attacks in 802.11 via ebpf and xdp,” in *2025 IEEE 11th International Conference on Network Softwarization (NetSoft)*, 2025, pp. 333–337.
- [12] A. Samanta, A. Pinto, and F. Esposito, “Rubix: Adaptive and fast-performant scaling for serverless-enabled ml platforms,” in *International Parallel and Distributed Processing Symposium (IPDPS)*, 2026.
- [13] L. Guo, F. Fiorella, A. Pinto, A. Sacco, M. Mahmoud, and F. Esposito, “MAESTRO: Supporting real-time segmentation networks on surgical systems via edge computing,” in *Medical Imaging with Deep Learning - Short Papers*, 2025. [Online]. Available: <https://openreview.net/forum?id=ZkgmlmyJ8o>
- [14] E. Paolini, A. Pinto, L. Valcarenghi, N. Andriolli, L. Maggiani, and F. Esposito, “Efficient distributed learning over lossy wireless networks,” in *2024 20th International Conference on Network and Service Management (CNSM)*, 2024, pp. 1–7.
- [15] A. Pinto, E. Paolini, and F. Esposito, “FLLLM: Federated learning clients selection via llm reinforcement loop,” in *Under submission*, 2026.