Enrico Piovano

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Work Experience

Applied Scientist II 2019 — Present
Amazon, Artificial General Intelligence - AGI, (ex-Alexa AI), Berlin, Germany

- Working on Large Language Models.
- Topics: Large Language Models (LLM Training and Evaluation), Transformer-based Natural Language Understanding (NLU) models, Online Performance Prediction from Offline Metrics, Synthetic Data Generation, Dialog Evaluation and Offline Prediction of Dialog Defects, A/B testing.
- (Some) Achievements: 1) Developed a key algorithm for predicting online performance from offline metrics, which was adopted globally for Alexa's NLU system; 2) Developed and rolled out NLU Deep Neural Network (DNN) model for German locale, marking the first international deployment; 3) Optimized large-scale LLMs for enhanced performance and efficiency.
- Operations: End-to-end NLU Model Build and Releases for DE, FR, enGB, enAU, enCA locales.
- Coding: Production code for several internal tools and repositories (development and unit testing).
- Managed two interns and mentored a third one, working on Data Mixing for Domain Classification, Training Data Optimization for Domain and Intent-Entities classification of NLU models, Prediction of Online Interaction Quality of Conversational Assistants.
- Experience in leading and managing several projects.
- Started as Research Scientist I, promoted to Research Scientist II, and then Applied Scientist II.

Graduate Student Researcher 2015 — 2019
Imperial College London, London, United Kingdom

- Studied fundamental limits of cache-aided wireless networks under various types of uncertainties.
- Investigated high-SNR capacity of wireless networks with imperfect channel knowledge.
- Deep Learning-based design of wireless communication systems for simultaneous information and power transfer.
- Supervised three MSc students' theses on MIMO Networks with Imperfect CSIT.

System Design Engineer Intern 2014
Qualcomm Research, Nuremberg, Germany

- Worked six months in the Corporate Research and Development division of Qualcomm.
- Designed and implemented new closed-loop beamforming algorithms for the next generation of 802.11ah WiFi modems.
- Won the Roberto Padovani Scholarship, awarded to the seven best performing interns in Qualcomm Research.

Research Intern 2012
National Research Council, Turin, Italy

- Analyzed, designed, and optimized high-efficiency horn antennas.

Education

PhD in Electrical Engineering (Information Theory, Communications, Applied Mathematics) 2015 — 2019
Imperial College London, London, United Kingdom

- PhD Thesis: Fundamental limits of robust interference management: from content-oblivious to content-aware wireless networks.

MSc in Electrical Engineering[1] 2012 — 2015
Telecom ParisTech, Paris, France

- GPA: 4.0/4.0, Top student of the class.

Master in Mobile Computing Systems[1] 2012 — 2015
Eurecom Institute, Sophia Antipolis, France

- GPA: 4.0/4.0, Top student of the class.

MSc in Electrical Engineering[1] 2012 — 2015
Turin Polytechnic, Turin, Italy

- Degree Classification: 110 Summa Cum Laude (highest award).
- GPA: 4.0/4.0, Top student of the class.

[1] Three independent degrees awarded from three different institutes in the context of a double MSc degree program between Turin Polytechnic and Telecom ParisTech, carried out at Politecnico di Torino and at Eurecom Institute.

BSc in Electrical Engineering 2009 — 2012
Turin Polytechnic, Turin, Italy

- Degree Classification: 110 Summa Cum Laude (highest award).
- GPA: 4.0/4.0, Top student of the class.

Awards and Honors

Doctoral Training Award, *Engineering and Physical Sciences Research Council (EPSRC) UK*, 2015 — 2019

Roberto Padovani Scholarship, *Qualcomm Research*, for being one of the seven best performing interns of the year, 2014

Top Bachelor Graduate Student, *Politecnico di Torino and Collegio Einaudi*, 2013

Gold Medal at the National Mathematical Olympiads, 2009

Silver Medal at the National Mathematical Olympiads, 2008

International Publications

Journal Papers

1. Y. Mao, **E. Piovano** and B. Clerckx, "Rate-splitting multiple access for overloaded cellular internet of things," *IEEE Transactions on Communications*, 2021.
2. **E. Piovano**, H. Joudeh and B. Clerckx, "Centralized and Decentralized Cache-Aided Interference Management in Heterogeneous Parallel Channels," *IEEE Transactions on Communications*, 2020.
3. **E. Piovano**, H. Joudeh and B. Clerckx, "Generalized Degrees of Freedom of the Symmetric Cache-Aided MISO Broadcast Channel with Partial CSIT," *IEEE Transactions on Information Theory*, 2019.
4. **E. Piovano** and B. Clerckx, "Optimal DoF Region of the K-User MISO BC With Partial CSIT," *IEEE Communications Letters*, 2017.

Conference Papers

1. Y. Gao*, **E. Piovano***, T. Soliman*, M. Moniruzzaman, A. Kumar, M. Bradford and S. Nandi, (*equal contribution), "Predicting Interaction Quality of Conversational Assistants With Spoken Language Understanding Model Confidences," in *International Conference on Information and Knowledge Management (CIKM), Applied Research Track*, 2023.
2. **E. Piovano**, D. T. Le, B. Chen and M. Bradford, "Online Adaptive Metrics for Model Evaluation of Non-representative Offline Test Data," in *International Conference on Pattern Recognition (ICPR)*, 2022, and Selected for Oral Presentation (10% acceptance rate).
3. V. Weber, **E. Piovano** and M. Bradford, "It is better to Verify: Semi-Supervised Learning with a human in the loop for large-scale NLU models," in *NAACL Workshop on Data Science with Human in the Loop: Language Advances*, 2021.
4. M. Varasteh, **E. Piovano** and B. Clerckx, "A Learning Approach to Wireless Information and Power Transfer Signal and System Design," in *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2019.
5. **E. Piovano**, H. Joudeh and B. Clerckx, "Robust Cache-Aided Interference Management Under Full Transmitter Cooperation," in *IEEE International Symposium on Information Theory (ISIT)*, 2018.
6. **E. Piovano**, H. Joudeh and B. Clerckx, "On coded caching in the overloaded MISO broadcast channel," in *IEEE International Symposium on Information Theory (ISIT)*, 2017.
7. **E. Piovano**, H. Joudeh and B. Clerckx, "Overloaded multiuser MISO transmission with imperfect CSIT," in *Asilomar Conference on Signals, Systems and Computers (Asilomar)*, 2016.

Professional Services and Activities

Reviewer for top tier journals and conferences including: IEEE Transactions on Information Theory, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, IEEE Journal of Selected Areas in Communications, IEEE Communication Letters, IEEE ITW, IEEE SPAWC, IEEE GLOBECOM, IEEE WCNC.