Cecilia Ferrando

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Education

University of Massachusetts Amherst — *Amherst, MA*

PhD in Computer Science — *Aug. 2019 - May 2024 (exp.)*

- CICS Fellow (merit scholarship for Computer Science students, 2019-2020)
- Cadence Women in Technology Scholar (2019-2020)
- Committee Against Racism and for Equity (2020-), WiDS Amherst 2021 Co-Chair (2020-)

Carnegie Mellon University — *Pittsburgh, PA*

MS in Computational Design, focus on Machine Learning — *Aug. 2016 - May 2018*

- Fulbright Scholar

Polytechnic University of Turin and Collegio Carlo Alberto — *Turin, Italy*

Honors BS+MS Double Degree, Majors: Economics and Statistics, Architecture — *Sep. 2010 - Jul. 2016*

- Collegio Carlo Alberto "Allievi" Scholar
- Alta Scuola Politecnica Scholar
- Won EU-funded scholarship to study abroad in Paris, France (2014-2015)

Research Experience

University of Massachusetts Amherst — *Amherst, MA*

Research Assistant to prof. Daniel Sheldon, Probabilistic Machine Learning — *Aug. 2019 -*

- Published research on uncertainty quantification in differential privacy
- Performed extensive literature reviews
- Implemented code for differentially-private inference and uncertainty estimation, as well as output visualization
- Developing new methods and algorithms for reasoning about differential privacy noise in various inference problems
- Adapting bootstrap methods for uncertainty estimation and bias reduction in differentially-private inference problems
- Analyzing disparate impact of the bias induced by privacy mechanisms, for example on deep neural networks
- Responsible for organizing weekly meetings for eight PhD and Master's students in prof. Sheldon's lab

Carnegie Mellon University — *Pittsburgh, PA*

Research Assistant to prof. Daniel Cardoso Llach, Spatial Machine Learning — *May 2017 - Apr. 2018*

- Published research on applications of machine learning for spatial analysis of architectural plans
- Presented Master's thesis work at Spatial Cognition 2018, winning Best Poster Presentation award
- Implemented graph learning techniques and visibility graphs to study spatial hierarchies
- Developed novel method to mathematically encode the spatial "footprint" of architectural plans
- Trained statistical models to correctly classify architectural plans based on their graph embedding
- Contributed to curating an exhibition on the origins of computer-aided design (CAD)

Industry Experience

Cadence Design Systems — *Pittsburgh, PA*

Machine Learning Software Engineer — *Jun. 2018 - May 2019*

- Conducted applied research on generative adversarial networks, capsule networks, graph matching, implementing algorithms from scratch
- Improved the performance of a company-specific classification algorithm by 11% by integrating capsule networks in existing algorithm
- Communicated results with audiences of different expertise and background
- Invited to present my methods and results at Cadence Machine Learning Summit 2019, attendees included company's top scientific and executive leadership

Procore Technologies *Carpinteria, CA*

Quantitative Research Intern *May 2017 - Jul. 2017*

- Developed data analytic app for uncertainty estimation of statistics derived from user data. The company has adopted my app for routine use in their survey data analysis pipeline
- Communicated quantitative results with technical and non-technical audiences
- Collaborated with UX, Engineering and Finance teams

Publications

C. Ferrando, S. Wang, D. Sheldon, *General-Purpose Differentially-Private Confidence Intervals*, Theory and Practice of Differential Privacy (TPDP) 2020

C. Ferrando, N. Dalmasso, J. Mai, D. Cardoso Llach, *Architectural Distant Reading – Using Machine Learning to Identify Typological Traits Across Multiple Buildings*, CUMINCAD 2019

C. Ferrando, *A Machine Learning Framework for Spatial Analysis*, Best Poster Presentation award, Spatial Cognition 2018

Selected Projects

Fall 2019	**Adaptive robust regression for heteroskedastic data**, UMass Amherst CS689 Machine Learning, final project with Kenta Takatsu
Spring 2017	**HP-Intel NASA Design Challenge "Life in Space"**, 1st prize winning team project
Fall 2016	**The Harmonograph**, Carnegie Mellon 15-112 Fundamentals of CS and Programming, final project, 2nd prize over 400+ projects

Honors & Awards

Scholarships and Fellowships

2020	**Cadence Women in Technology Scholarship**, Cadence Design Systems
2019	**CS Fellowship**, CICS, University of Massachusetts Amherst
2016-2018	**Fulbright Scholarship ($40,000)**, US Department of State
2010-2016	**Collegio Carlo Alberto "Allievi" Scholarship ($17,000)**, Collegio Carlo Alberto, Turin, Italy
2010-2016	**Alta Scuola Politecnica**, top 1% students, Polytechnic University of Turin, Italy
2014-2015	**Erasmus+ Scholarship**, European Union

Awards

2020	**GHC 2020 registration award**, CICS, University of Massachusetts Amherst
2020	**ICML 2020 registration award**, Women in Machine Learning
2020	**ICLR 2020 registration award**, Women in Machine Learning
2019	**NeurIPS 2019 travel and registration award**, NeurIPS Conference
2019	**NeurIPS 2019 travel award**, CS Women, CICS, University of Massachusetts Amherst
2017	**First Prize**, HP-Intel "Life in Space" Design Challenge, CMU team
2017	**Second Prize**, Carnegie Mellon 15-112 best CS projects over more than 400
2009	**Albo delle Eccellenze**, top high-school students in Italy, Italian Ministry of Education

Conference presentations

2018	**Spatial Cognition 2018 Best Poster Award**, Spatial Cognition 2018, Tuebingen, Germany

Teaching & Mentorship

University of Massachusetts Amherst *Amherst, MA*

Graduate mentor, CICS Undergraduate Summer Research program *Jun. 2020 - Aug. 2020*

- Mentored two undergraduate students conducting applied research connected to differential privacy
- Provided weekly 1-1 guidance and feedback tailored on each student

Service & Leadership

2020-	**Committee Against Racism and for Equity**, CICS, University of Massachusetts Amherst. Piloting new PhD Application Support Program for underrepresented applicants.
2020-	**Women in Data Science (WiDS) Amherst**, Co-Chair. Leading the committee organizing inaugural WiDS Amherst 2021 conference.
2020	**UMass Graduate CS Women group**, Social Co-Chair. Organized networking events for CS women graduate students and faculty.
2020	**New Student Committee**, CICS, University of Massachusetts Amherst. Contributed to PhD candidate visit day.
2018	**Greater Pittsburgh Community Food Bank**, volunteered with the Cadence Global Giving program.

Skills

Programming	Python (NumPy, SciPy, PyTorch, TensorFlow, jupyter, matplotlib), C++, Matlab, git, LaTeX
Design	Adobe Photoshop, InDesign, Illustrator, PremierePro. Autodesk AutoCAD, 3DSMax. Rhino, Grasshopper
Languages	Italian (native), English (advanced), French (advanced)