Luca Masserano

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EDUCATION

Carnegie Mellon University, PhD in Statistics and Machine Learning — Aug 2020 – May 2025 (Expected)
Joint PhD Program between the Machine Learning and Statistics Departments
Advisors: Ann B. Lee, Barnabás Póczos
Awards: CMU 2024 Presidential Fellow for the Statistics Department

Bocconi University, M.Sc. in Data Science — Sep 2018 – Jul 2020
GPA: 29.3/30, Final Grade: 110/110 *cum laude*

Università Cattolica del Sacro Cuore, B.Sc. in Quantitative Methods for Economics — Sep 2015 – Sep 2018
GPA: 29.2/30, Final Grade: 110/110 *cum laude*

EXPERIENCE

Carnegie Mellon University, Doctoral Researcher — Aug 2020 – present

- **Reliable Uncertainty Quantification for Machine Learning in Science:** I develop methods with sound statistical guarantees leveraging modern machine learning (e.g., deep generative models) to quantify the uncertainty on parameters that govern complex physical processes. This entails working in likelihood-free settings, where models of reality are specified implicitly through simulators, which can suffer from misspecifications and distribution shifts relative to observational data. We collaborate with scientists in several domains to enable AI-powered scientific discovery.

Amazon (AWS AI Labs), Machine Learning Scientist Intern — Jun – Aug 2022/2023/2024

- **Project (2024, ongoing):** Tokenization via Wavelet Decomposition for Time Series Foundation Models.
- **Project (2023):** End-to-end Learning of Mixed-Integer Programs via Stochastic Perturbations.
  Offered to return for another internship in 2024.
- **Project (2022):** Adaptive Sampling for Probabilistic Forecasting Under Distribution Shifts.
  Offered to return for another internship in 2023.

BlackRock, Quantitative Analyst Intern — Jul 2019 – Sep 2019

- **Project:** Development of a research platform to analyze the effect of modifications in a suite of equity risk models.
  Offered to return full-time in 2020.

SmartFAB, Data Scientist Intern — Mar 2019 – May 2019

- **Project:** Real-time detection of damaged integrated circuits produced in a semiconductor plant.

SELECTED PUBLICATIONS AND PREPRINTS

Masserano, L., Ansari, A. F., Han, B., Rangapuram, S., Faloutsos, C, Mahoney, M., Maddix, D. C., Wang, Y. (2024) *Tokenization via Wavelet Decomposition for Time Series Foundation Models*. In preparation.

Masserano, L., Rangapuram, S., Stella, L., Benidis, K., Rosolia, U., Bohlke-Schneider, M. (2023) *End-to-end Learning of Mixed-Integer Programs via Stochastic Perturbations*. In preparation.

Masserano, L., Shen, A., Dorigo, T., Doro M., Izbicki R., Lee, A. (2023) *Classification under Nuisance Parameters and Generalized Label Shift in Likelihood-Free Inference*. ICML 2024; NeurIPS 2023 ML4PS Best Poster Award

Masserano, L., Dorigo, T., Izbicki, R., Kuusela, M., Lee, A. (2023) *Simulation-Based Inference with Waldo: Confidence Regions by Leveraging Prediction Algorithms and Posterior Estimators for Inverse Problems*. AISTATS; ASA Paper Award

Masserano, L., Rangapuram, S., Kapoor, S., Nirwan, R.S., Park, Y., Bohlke-Schneider, M. (2022) *Adaptive Sampling for Probabilistic Forecasting under Distribution Shifts*. NeurIPS 2022 DistShift Workshop

Dalmasso, N.*, **Masserano, L.***, Zhao, D., Izbicki, R., Lee, A. (2021) *Likelihood-Free Frequentist Inference: Bridging Classical Statistics and Machine Learning for Simulation-Based Inference*. *Equal contribution. Electronic Journal of Statistics

COMPUTER SKILLS AND LANGUAGES

CODING: Python, R, Bash, LaTeX, Git. Developer and maintainer of the lf2i package for likelihood-free inference.

LANGUAGES: Italian (native), English (fluent), Spanish (intermediate)

SERVICE

Teaching Assistant at Carnegie Mellon University

- Computing TA: helping PhD students and faculty with research-related computing needs
- STAT 36401 - Modern Regression (Head TA in Fall 2021)
- STAT 36462 - Statistical Machine Learning

AWARDS

CMU 2024 Presidential Fellow for the Statistics Department **Jan 2024**
Awarded only to one student every year in recognition of research, contributions to pedagogy, and department citizenship

SIAM Student Travel Award **Jan 2024**
Awarded a travel grant through a competitive process to take part to the 2024 SIAM Uncertainty Quantification conference

Best Poster Award at the NeurIPS Machine Learning for Physical Sciences Workshop **Dec 2023**
Classification under Nuisance Parameters and Generalized Label Shift in Likelihood-Free Inference

Student Paper Award by the American Statistical Association, Section on Physical Sciences **Jan 2023**
Simulation-based Inference with WALDO: Confidence Regions by Leveraging Prediction Algorithms and Posterior Estimators

SELECTED TALKS

SIAM Uncertainty Quantification Conference **Trieste, Italy**
Reliable Uncertainty Quantification for Machine Learning in Science Feb 2024

AISTATS **Valencia, Spain**
SBI with WALDO: Confidence Regions by Leveraging Prediction Algorithms and Posterior Estimators Apr 2023

NeurIPS - Machine Learning and the Physical Sciences Workshop **New Orleans, LA**
Likelihood-Free Frequentist Inference for Calorimetric Muon Energy Measurement in High-Energy Physics Dec 2022

NeurIPS - Distribution Shifts Workshop **New Orleans, LA**
Adaptive Sampling for Probabilistic Forecasting under Distribution Shift Dec 2022

ML4Jets **Rutgers University, Piscataway, NJ**
SBI with WALDO: Confidence Regions by Leveraging Prediction Algorithms and Posterior Estimators Nov 2022

Joint Statistical Meetings (JSM) **Washington, D.C.**
SBI with WALDO: Confidence Regions by Leveraging Prediction Algorithms and Posterior Estimators Aug 2022

5th Inter-experiment Machine Learning (IML) Workshop **CERN, Geneva, Switzerland**
SBI with WALDO: Confidence Regions by Leveraging Prediction Algorithms and Posterior Estimators May 2022

EXTRACURRICULAR ACTIVITIES

Professional Soccer Player
I played as goalkeeper from 2012 to 2015 in different professional leagues in Italy. I stopped due to an injury.