Renato Berlinghieri

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Education

2021 – Present	**Massachusetts Institute of Technology** – Cambridge, MA PhD in Electrical Engineering and Computer Science Advisor: Tamara Broderick. Current coursework: probability theory, probabilistic graphical models, non-asymptotic statistics, bayesian inference, deep learning.
2019 – 2021	**Bocconi University** – Milan, Italy MSc in Data Science and Business Analytics Supervisors: Igor Prünster and Antonio Lijoi. *GPA: 30/30 – Final grade: 110/110 cum laude (graduated rank 1 of my class).* Main coursework: statistical learning, Bayesian inference, optimization, stochastic processes, deep learning, statistical physics.
2016 – 2019	**Bocconi University** – Milan, Italy BSc in Economics, Management and Computer Science *GPA: 30/30 – Final grade: 110/110 cum laude (graduated rank 1 of my class).* Main coursework: statistics, algorithms, machine learning, programming (Python, R, Julia). Study abroad at UC San Diego (Winter 2019). Major in mathematics. *Term GPA: 4.0/4.0.*

Experience

2023 – Summer	**Apple Inc.** *Machine Learning Research intern in the Health AI team* Developing generative models for solving discrete combinatorial optimization problems relevant for Apple Health AI team.
2021 – Present	**MIT Laboratory for Information & Decision Systems (LIDS)** *Research assistant. Advisor: Tamara Broderick.* Developing Bayesian methodology for modeling, inference, and evaluation of applied and theoretical problems. I am currently focused on building a physics-informed Gaussian Process model to infer ocean currents from observations of the trajectories of surface drifter buoys.
2020 – 2021	**BayesLab, Bocconi Institute for Data Science and Analytics (BIDSA)** *Visiting student research assistant. Mentors: Igor Prünster and Antonio Lijoi.* Studying Bayesian nonparametric models using completely random measures, I investigated a framework for measuring model dependence based on optimal transport/Wasserstein distance.
2018 – 2020	**Bocconi University Department of decision sciences** *Intern research assistant. Supervisor: Massimo Marinacci.* Developed methodology to study neuroeconomics using statistical models for decision making and simulations (in *Julia* and *Python*).
2017 – 2018	**Bocconi University IGIER Research center** *Undergraduate research assistant.* Developed data scraping and NLP routines for economic research in *Python*. In particular, analysis of sentiment towards immigration and racial discrimination in the US at the beginning of 20th century.

Publications & Preprints

2023	**"Gaussian processes at the Helm (holtz): A more fluid model for ocean currents."** To appear at ICML 2023. arXiv:2302.10364 (Berlinghieri, R.; Trippe, B. L.; Burt, D. R.; Giordano, R.; Srinivasan, K.; Özgökmen, T.; Junfei, X.; Broderick, T.) **"Measuring utility with diffusion models."** To appear in Science Advances, 2023. (Berlinghieri, R.; Krajbich, I.; Maccheroni, F.; Marinacci, M.; Pirazzini, M.)

| 2022 | **"Subspace diffusion generative models."** In *European Conference on Computer Vision 2022.* (Jing, B.*; Corso, G.*; Berlinghieri, R.; Jaakkola, T.) |

Awards and scholarships

2023	36th New England Statistics Symposium Student Poster Award
2023	28th Annual LIDS Student Conference best presentation award for the Optimization and Algorithms session
2022	Complementary travel grant for NeurIPS 2022 (*provided by NeurIPS Workshop on Gaussian Processes, Spatiotemporal Modeling, and Decision-making Systems' organizers*)
2022	ISBA best poster award for the category BayesComp/j-ISBA
2022	BAYSM Microsoft award for best contributed talk
2019 – 2021	Bocconi graduate merit award
2016	30th International Championship for Mathematical and Logical games. *Category L2: 2nd national place (Milan, May), 6th international place (Paris, August)*
2014	1st national place at Mathematical Modelling competition (Perugia, category intermediate).

Talks, poster sessions and conference presentations

- Approximation Methods in Bayesian Analysis Workshop. CIRM Marseille, June 2023. *"Gaussian processes at the Helm(holtz): A more fluid model for ocean currents."* [Contributed Talk, Poster]

- NESS 2023. Boston MA, June 2023. *"Gaussian processes at the Helm(holtz): A more fluid model for ocean currents."* [Contributed Talk, Poster]

- MIT Machine Learning Advances Symposium. Cambridge MA, May 2023. *"Gaussian processes at the Helm(holtz): A more fluid model for ocean currents."* [Spotlight talk]

- 28th Annual LIDS Student Conference. Cambridge MA, February 2023. *"Gaussian processes at the Helm(holtz): A more fluid model for ocean currents."* [Contributed talk]

- NeurIPS Workshop on Gaussian Processes, Spatiotemporal Modeling, and Decision-making Systems. New Orleans LA, December 2022. *"Gaussian processes at the Helm(holtz): A better way to model ocean currents."* [Contributed talk]

- 13th International Conference on Bayesian Nonparametrics (BNP13). Puerto Varas, Chile, October 2022. *"Gaussian processes at the Helm(holtz): A better way to model ocean currents."* [Contributed talk]

- World Meeting of the International Society for Bayesian Analysis (ISBA 2022). Montreal, Canada, July 2022. *"Gaussian processes at the Helm(holtz): A better way to model ocean currents."* [Poster session]

- Bayesian Young Statisticians Meeting (BAYSM 2022). Montreal, Canada, June 2022. *"Gaussian processes at the Helm(holtz): A better way to model ocean currents."* [Contributed talk]

- MIT Statistics and Data Science Conference (SDSCon), Cambridge MA, April 2022. *"Gaussian processes at the Helm(holtz): A better way to model ocean currents."*

Leadership, mentorship, and extra-curricular activities

- *Co-President*, EECS Graduate Student Association, MIT.

- Board member of MITaly, the Italian association at MIT.

- MIT Graduate application assistant program (GAAP) *mentor* - this program is designed for providing assistance during grad school application to underrepresented groups.

- Mentor and former mentee of *LeadTheFuture*, a leading mentorship non-profit organization for Italian students in STEM, with acceptance rate below 20%.

- Former President and co-founder of *Computational Society for Bocconi Students* – the first student society at Bocconi University interested in Computer Science and Statistics.

- Former course representative, student Ambassador, and member of the *MSc in Data Science committee* at Bocconi University - active participation in planning courses' structure and mentoring activities for incoming BSc and MSc students.

- Junior tutor for nation-wide *Olympiads of mathematics workshops.* Main activities: teaching algebra, combinatorics, and number theory lectures. Select exercises and organise competitions' simulations.

- *Interests:* running, swimming, playing basketball, soccer, amateur cooking, playing piano, memes.

Skills

- *Softwares and programming languages*: Python (proficient), R (familiar), Julia (familiar), C/C++ (basic), LaTeX, Git.
- *Theory*: Bayesian modeling, machine learning, probability theory, stochastic processes.
- *Languages*: English (fluent), Italian (native), Spanish (basic).