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. Minor in mathematics

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).

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).
Study abroad at UC San Diego (Winter 2019). Major in mathematics. *Term GPA: 4.0/4.0.*

Experience

2023 – Summer **Apple Inc.** - Seattle, WA
Machine Learning Research Intern, Health AI

2020 – 2021 **BayesLab, Bocconi Institute for Data Science and Analytics (BIDSA)** - Milan, Italy
Visiting Student Research Assistant

2018 – Summer **Morgan Stanley** - London, UK
Software Engineering Intern

Publications & Preprints

2024 **"Multi-marginal Schrödinger Bridges with Iterative Reference Refinement"**. Arxiv preprint arXiv:2408.06277. (Shen, Y.*; Berlinghieri, R.*; Broderick, T.)

"Can individuals use smoke forecasts for personal decision-making? A call to action". Arxiv preprint arXiv:2409.05866. (Berlinghieri, R.*; Burt, D. R.*; Giani, P.; Fiore, A.; Broderick, T.)

2023 **"Gaussian processes at the Helm (holtz): A more fluid model for ocean currents"**. In *International Conference on Machine Learning 2023.* (Berlinghieri, R.; Trippe, B. L.; Burt, D. R.; Giordano, R.; Srinivasan, K.; Özgökmen, T.; Junfei, X.; Broderick, T.)

"Measuring utility with diffusion models". Science Advances 9 (34), 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.)

Workshop Publications

2024 **"Learning a vector field from snapshots of unidentified particles rather than particle trajectories"**. In *ICLR 2024 Workshop on AI4DifferentialEquations in Science.* (Shen, Y.*; Berlinghieri, R.*; Broderick, T.)

2023 **“Gaussian processes at the Helm (holtz): A more fluid model for ocean currents”**. In *ICLR 2023 Workshop on Physics for Machine Learning.* (Berlinghieri, R.; Trippe, B. L.; Burt, D. R.; Giordano, R.; Srinivasan, K.; Özgökmen, T.; Junfei, X.; Broderick, T.)

2022 **“Gaussian processes at the Helm(holtz): A better way to model ocean currents.”**. In *NeurIPS 2022 Workshop on Gaussian Processes, Spatiotemporal Modeling, and Decision-making Systems.* (Berlinghieri, R.; Trippe, B. L.; Burt, D. R.; Giordano, R.; Srinivasan, K.; Özgökmen, T.; Junfei, X.; Broderick, T.)

Awards and scholarships

2024 ISBA World Meeting travel award
AGU Annual Meeting 2023 outstanding student presentation award (OSPA)
2023 Bayesian Nonparametrics Networking Workshop 2023 travel award
EnviBayes Workshop on Complex Enviromental Data 2023 travel award
36th New England Statistics Symposium best student poster award
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*)
ISBA world meeting best poster award for the category BayesComp/j-ISBA
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

- Joint Statistical Meetings of American Statistical Association (JSM 2024). Portland OR. August 2024. *“Multimarginal Schrödinger Bridges with Iterative Reference Refinement.”* [Contributed talk]
- World Meeting of the International Society for Bayesian Analysis (ISBA 2024). Venice. July 2024. *“Gaussian processes at the Helm(holtz): A more fluid model for ocean currents.”* [Contributed talk]
- Bayesian Young Statisticians Meeting (BAYSM 2024). Venice. June 2024. *“Multi-marginal Schrödinger Bridges with Iterative Reference Refinement.”* [Poster]
- Satellite workshop to ISBA world meeting. Lugano. June 2024. *“Gaussian processes at the Helm(holtz): A more fluid model for ocean currents.”* [Poster]
- HAQAST Massachusetts. Cambridge, MA. June 2024. *“Can individuals use smoke forecasts for personal decision-making? A call to action”* [Poster]
- ICLR 2024 Workshop on AI4DifferentialEquations in Science. Vienna. May 2024. *“Multi-marginal Schrödinger Bridges with Iterative Reference Refinement.”* [Poster]
- AGU Annual Meeting. San Francisco, CA. December 2023. *“Gaussian processes at the Helm(holtz): A more fluid model for ocean currents.”* [**Invited talk @ physics-informed machine learning session**]
- Bayesian Nonparametrics Networking Workshop 2023. Melbourne, December 2023. *“Gaussian processes at the Helm(holtz): A more fluid model for ocean currents.”* [Poster]
- EnviBayes workshop on complex enviromental data 2023. Fort Collins CO, September 2023. *“Gaussian processes at the Helm(holtz): A more fluid model for ocean currents.”* [Poster]
- Bayesian Nonparametrics Networking Workshop 2023. Melbourne, December 2023. *“Gaussian processes at the Helm(holtz): A more fluid model for ocean currents.”* [Poster]
- EnviBayes workshop on complex enviromental data 2023. Fort Collins CO, September 2023. *“Gaussian processes at the Helm(holtz): A more fluid model for ocean currents.”* [Poster]
- Bayesian Nonparametrics Networking Workshop 2023. Melbourne, December 2023. *“Gaussian processes at the Helm(holtz): A more fluid model for ocean currents.”* [Poster]
- EnviBayes workshop on complex enviromental data 2023. Fort Collins CO, September 2023. *“Gaussian processes at the Helm(holtz): A more fluid model for ocean currents.”* [Poster]

- International Conference on Machine Learning. Honolulu HI, July 2023. *"Gaussian processes at the Helm(holtz): A more fluid model for ocean currents."* [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-organizer of the Virtual Seminar Series on Gaussian Processes, Spatiotemporal Modeling, and Decision-making Systems.
- Program Chair and Organizer of NeurIPS 2024 Workshop on Bayesian Decision-making and Uncertainty.
- Former *Co-President*, EECS Graduate Student Association, MIT (2023).
- Organizer of reading group *"Optimal Transport for Everyone"* at MIT (2023).
- 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.

Skills

- *Softwares and programming languages*: Python (proficient), R (familiar), Julia (familiar), C/C++ (basic), LaTeX, Git.
- *Research Interests*: Spatiotemporal modeling, Gaussian Processes, Optimal Transport, Bayesian modeling, Generative models.
- *Languages*: English (fluent), Italian (native), Spanish (basic).