Fabio Mazza

Born in Torino, Italy, in 1995

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Education

2019 – 2023 **PhD student in Physics** *Politecnico di Torino* Torino, Italy
The focus of the PhD has been the study of statistical inference methods in the context of epidemic spreading, that can be applied to epidemic control on large-scale contact networks. The potential of deep learning methods was also investigated. The PhD program was supported by a scolarship from the SmartData@PoliTo interdepartemental center.

2018 – 2019 **M2 in Physics of Complex Systems** , *Université Paris Diderot*. Mention Très bien

March 2019 **Spring College on the Physics of Complex Systems** *ICTP, Trieste, Italy*
Topics covered: Self-organized criticality, Elements of Quantitative Finance, Randomness in Biology, Statistical Mechanics of Two Dimensional Critical Curves, Electrostatic Interactions in Soft and Biological Matter.

2017 – 2019 **M.Sc. in Physics of Complex Systems, international track**, *Politecnico di Torino, ICTP and SISSA, Paris Diderot, Paris Sud and UPMC*, Final grade of 110/100 cum laude
Thesis title: *Multiscale modeling of influenza viral emergence*
The International Master of Science in Physics of Complex Systems is a selective double-degree program providing the most advanced concepts and methods needed to tackle emergent interdisciplinary problems. Study semesters took place in Trieste, than Torino and finally Paris, finishing with the Spring College in Physics of Complex Systems. The programme was convered by a scolarship in the Paris and Trieste semesters.

2014 – 2017 **Bachelor Degree in Physical Engineering**, *Politecnico di Torino*, Torino, Italy
Final grade 109/110

2012 – 2013 **AFS exchange student in Malaysia**: Year-long program of cultural exchange, during the penultimate year of high school.

Selected PhD courses

- Stochastic optimization and optimal learning
- Data mining concepts and algorithms
- Big data processing and programming
- Adversarial training of neural networks

Experience

2019 **Master of Science Internship** *INSERM, UMR-S 1136, Institut Pierre Louis d'Epidémiologie et de Santé Publique* Paris, France
Thesis work: *Multiscale modeling of influenza viral emergence*
The internship focused on the design and implementation of a nested model of influenza viral emergence based on a metapopulation framework, accounting for within-host viral dynamics and host-to-host diffusion on contact network.

2017 – 2018 **Visiting student**, *SISSA and ICTP*, Trieste, Italy

Experience (continued)

2017 **Bachelor's degree internship** *Prima Electro S.P.A.*, Torino, Italy
Characterization of high power semiconductor lasers: an optional part of the Bachelor's degree course in Physical Engineering, the internship included a total of 300 hours of work in close contact with the research and development team, on the validation of in-house products.

Talks

2021 **SmartData Center @ Politecnico di Torino**, Torino, Italy
Reconstructing epidemic cascades with autoregressive neural networks - part of the SmartTalks series

Teaching and others

2018 **Laboratory assistant in Physics I**, *Politecnico di Torino*
Assistance to bachelor students in the experimental part of the Physics I course

2016 **WEEE Open Student Team**, *Politecnico di Torino*
Founding member of the team, born with the aim of regenerating dismissed electronical equipment and donating it to other public institutions and non-profit organizations.

Software development

2016-2022 **Main developer for Libre Bus-Torino (BusTO)**, *gitpull.it/w/librebusto*
Libre BusTO is an open-source (FOSS) app for the public transport in the province of Torino, that protects users' privacy while searching for arrival times and nearby stops on Android devices.

Skills

Languages

Italian — Mother tongue

English — Strong reading, writing, listening and speaking skills, C1 Level
Certifications: IELTS 7.0 2014

French — Very good reading, listening and speaking skills, B2 Level

Others

- Solid programming skills in C++, Python, Julia and Java
- Very good level in Fortran and in LaTeX writing
- Data analysis with Python (scientific libraries) and Numba
- Extensive experience with Linux operating system (10+ years of using Ubuntu, Fedora, Arch Linux)

Publications and preprints

Braunstein, A., Catania, G., Dall'Asta, L., Mariani, M., **Mazza**, **F.**, & Tarabolo, M. (2023, June 6). Small-coupling dynamic cavity: A bayesian mean-field framework for epidemic inference. https://doi.org/10.48550/arXiv.2306.03829

Biazzo, I., Braunstein, A., Dall'Asta, L., & **Mazza**, **F.** (2022). A bayesian generative neural network framework for epidemic inference problems. *Scientific Reports*, *12*(1), 19673. https://doi.org/10.1038/s41598-022-20898-x

Baker, A., Biazzo, I., Braunstein, A., Catania, G., Dall'Asta, L., Ingrosso, A., Krzakala, F., **Mazza**, **F.**, Mézard, M., Muntoni, A. P., Refinetti, M., Mannelli, S. S., & Zdeborová, L. (2021). Epidemic mitigation by statistical inference from contact tracing data. *Proceedings of the National Academy of Sciences*, *118*(32). https://doi.org/10.1073/pnas.2106548118