Fabrizio Boninsegna

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 NynsenFaber

Personal Details

Nationality: Italian

Education

Ph.D. in Information Engineering
University of Padova   *2022 – present*
Supervisor: Francesco Silvestri *Co-supervisor:* Martin Aumüller
Topic: Algorithms for Differential Privacy and Mobility (in collaboration with Motion Analytica Srl)

Master's Degree in Physics
University of Padova, 110/110 cum laude, (weighted Average: 29.25/30)   *2019 – 2022*
Thesis: *Problems of Ranking and Dynamics of Complex Bipartite Networks in Economic Complexity*
Supervisor: Fulvio Baldovin; *Co-supervisors*: Attilio L. Stella, Gianluca Teza
Main Courses: Statistical Physics, Complex Systems, Many Body Quantum Theory.

Bachelor's Degree in Physics
University of Padova, 105/110, (weighted average: 27.15/30)   *2016 – 2019*
Thesis: *Solitons in Classical and Quantum Fluids*
Supervisor: Luca Salasnich

International Experience

IT University of Copenhagen - University of Copenhagen (BARC)
Visiting Researcher   *2024*
Conducted research on Differential Private Algorithms with Prof. Martin Aumüller and the Providentia group at Basic Research Algorithm Copenhagen (BARC). Focused on Locality Sensitive Filters for Differential Private Approximate Range Queries and Quantile Estimation with Local Differential Privacy.

Ruprecht Karl University of Heidelberg, Germany
Erasmus Exchange Program (winter semester)   *2020 – 2021*
Completed coursework in Monte Carlo Simulations, Many-Body Quantum Physics, and Quantum Information.

Work Experience

Academic Roles

Motion Analytical Srl
Ph.D. Student Researcher   *2022 - present*
Conducted research on mobility data, privacy, and smart mobility.

University of Padova
Physics Tutor   *2020*
Delivered online tutoring sessions for Bachelor students in Biology during the COVID-19 pandemic.

University of Padova
Librarian (Part-Time)   *2019*
Assisted with library operations as part of a 200-hour student work program.

Giardini dell'Arena / Parco della Musica, Padova
Bartender   *2021 – 2022*
Part-time bartender for events including concerts; full-time from April 2022.

Primiero San Martino di Castrozza
Waiter   *2016 – 2020*
Seasonal work during summer and winter at a four-star hotel.

Skills

Programming Languages

Python	■■■■◻	High proficiency with libraries for data science (`numpy`, `pandas`, `matplotlib`, etc.), geo-spatial analysis (`geopandas`, `shapely`), deep learning (`PyTorch`), and differential privacy (`OpenDP`).
Rust	■■■◻◻	Lower-intermediate level; developed a project on similarity search in high-dimensional spaces using Rust.
C++	■■◻◻◻	First programming language I learned during University in Physics.

Languages

English	■■■■◻	Full professional proficiency demonstrated through academic and research activities.

Soft Skills

Adaptability	Proven ability to excel across diverse academic disciplines, effortlessly transitioning between Physics and Computer Science while adapting to international and interdisciplinary research environments.

Personal Interests

Music:
○ Play bass guitar (5 years of jazz training during high school), guitar, piano, and synthesizer.
○ Interested in music production using digital audio workstations such as Logic Pro X and Ableton Live.
○ Published a self-produced album titled *L'assenzio* with my former progressive rock band *Elettroliti*.

Mountain:
○ Passionate about sport climbing and hiking, regularly engaging in outdoor activities.
○ I assist The South Adventure in guiding young enthusiasts of mountain hiking on their excursions.

List of Publications

[Bon+23]   Fabrizio Boninsegna et al. "Locality Sensitive Hashing of Trajectories Under Local Differential Privacy." In: *SEBD*. 2023, pp. 681–687.

[ABS24]   Martin Aumüller, Fabrizio Boninsegna, and Francesco Silvestri. *A Simple Linear Space Data Structure for ANN with Application in Differential Privacy*. 2024. arXiv: 2409.07187 [cs.DS]. URL: https://arxiv.org/abs/2409.07187.

[Aam+25]   Anders Aamand et al. *Lightweight Protocols for Distributed Private Quantile Estimation*. 2025. arXiv: 2502.02990 [cs.CR]. URL: https://arxiv.org/abs/2502.02990.

[BS25]   Fabrizio Boninsegna and Francesco Silvestri. *Differentially Private Release of Hierarchical Origin/Destination Data with a TopDown Approach*. accepted for pubblication in PETS-2025. 2025. arXiv: 2412.09256 [cs.DS]. URL: https://arxiv.org/abs/2412.09256.