

# Fabrizio Boninsegna

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in fabrizio-boninsegna • Ⓜ NynsenFaber

## Personal Details

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**Nationality:** Italian

## Education

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### Ph.D. in Information Engineering (Computer Science)

*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). Publications at ICML, NeurIPS, PETS and FORC.

### 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

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### 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.

## Professional References

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### Francesco Silvestri

Email: [silvestri@dei.unipd.it](mailto:silvestri@dei.unipd.it)

Associate Professor, University of Padova

### Martin Aumüller

Email: [maau@itu.dk](mailto:maau@itu.dk)

Associate Professor, IT University of Copenhagen

## Grants and Scholarships

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*Ing. Aldo Gini Foundation Scholarship*

2024

The scholarship covered part of the expenses for my visiting research period in Copenhagen.

*Oblivious, Oxford Differential Privacy Bootcamp*

2024

I was invited for a one-week bootcamp in differential privacy by Oblivious in Oxford.

## Work Experience

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### Academic Roles.....

#### **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

### Private Sector Roles.....

#### **Motion Analytical Srl**

*Ph.D. Student Researcher*

2022 - 2025

Conducted research on mobility data, privacy, and smart mobility; led a 15-minute city analysis project resulting in a journal publication.

#### **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

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### 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

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### Music:

- I 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

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- [1] Jacob Imola, Fabrizio Boninsegna, Hannah Keller, Anders Aamand, Amrita Roy Chowdhury, and Rasmus Pagh. *Differentially Private Quantiles with Smaller Error*. The Thirty-Ninth Annual Conference on Neural Information Processing Systems (NeurIPS 2025). 2025. arXiv: 2505.13662 [cs.DS]. URL: [arXiv:2505.13662](https://arxiv.org/abs/2505.13662).
- [2] Anders Aamand, Fabrizio Boninsegna, Abigail Gentle, Jacob Imola, and Rasmus Pagh. "Lightweight Protocols for Distributed Private Quantile Estimation". In: *Proceedings of the 42nd International Conference on Machine Learning*. Vol. 267. Proceedings of Machine Learning Research. 13–19 Jul 2025, pp. 27–58. URL: <https://proceedings.mlr.press/v267/aamand25a.html>.
- [3] Fabrizio Boninsegna and Francesco Silvestri. "Differentially Private Release of Hierarchical Origin/Destination Data with a TopDown Approach". In: *Proceedings on Privacy Enhancing Technologies Symposium* (2025).
- [4] Martin Aumüller, Fabrizio Boninsegna, and Francesco Silvestri. "Differentially Private High-Dimensional Approximate Range Counting, Revisited". In: *6th Symposium on Foundations of Responsible Computing*. 2025.
- [5] Fabrizio Boninsegna, Alessandro Nalin, Andrea Simone, Bruno Zamengo, Denis Cappellari, and Francesco Silvestri. "Towards a Fair and Comprehensive Evaluation of Walkable Accessibility and Attractivity in the 15 Min City Scenario Based on Demographic Data". In: *Infrastructures* 11.1 (2026). ISSN: 2412-3811. DOI: 10.3390/infrastructures11010004. URL: <https://www.mdpi.com/2412-3811/11/1/4>.
- [6] Hannah Keller, Jacob Imola, Fabrizio Boninsegna, Rasmus Pagh, and Amrita Roy Chowdhury. *Piquantε: Private Quantile Estimation in the Two-Server Model*. 2025. arXiv: 2509.14035v1 [cs.CR]. URL: <https://arxiv.org/abs/2509.14035v1>.
- [7] Fabrizio Boninsegna. *InfTDA: A Simple TopDown Mechanism for Hierarchical Differentially Private Counting Queries*. Workshop on Theory and Practice of Differential Privacy (TPDP). 2025. arXiv: 2505.05347 [cs.DS]. URL: <https://arxiv.org/abs/2505.05347>.
- [8] Jacob Imola, Fabrizio Boninsegna, Hannah Keller, Anders Aamand, Amrita Roy Chowdhury, and Rasmus Pagh. *Private Quantile Estimation in the Two Server Model*. Workshop on Theory and Practice of Differential Privacy (TPDP). 2025.

- [9] Fabrizio Boninsegna. "Locality Sensitive Hashing of Trajectories Under Local Differential Privacy". In: *Proceedings of the 31st Symposium of Advanced Database Systems, Galzingano Terme, Italy, July 2nd to 5th, 2023*. Vol. 3478. CEUR Workshop Proceedings. 2023, pp. 681–687. URL: <https://ceur-ws.org/Vol-3478/paper56.pdf>.