

# Lorenzo Beretta

IBM Research, Cambridge, MA

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## Research Interests

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High-dimensional geometry, high-dimensional probability, sublinear algorithms, property testing, optimal transport.

## Education

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- **Ph.D. in Computer Science University of Copenhagen** Oct 2020 – Apr 2024  
*Advised by Mikkel Thorup & Mikkel Abrahamsen*
- **Scuola Normale Superiore (Honors Program)** 2015 – 2020  
*During my B.S. and M.S, I took an additional 2-year workload of math and physics courses*
- **M.S. Computer Science, University of Pisa** Sep 2018 – Oct 2020  
*Grade 110/110 cum Laude*
- **B.S. Mathematics, University of Pisa** Sep 2015 – Oct 2018  
*Grade 110/110 cum Laude*

## Appointments

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- **Goldstine Fellow at IBM, Cambridge, MA** Sep 2025 – present  
*Hosted by Kenneth Clarkson*
- **Postdoc at University of California, Santa Cruz** Sep 2024 – Sep 2025  
*Hosted by Vaggos Chatziafratis*

## Awards

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- **Herman Goldstine Postdoctoral Fellowship at IBM** 2025
- **Best Student Paper Award, SODA 2022** 2022  
*for “Better Sum Estimation via Weighted Sampling”, also invited to **HALG 2022** and **TALG special issue***
- **EU TALENT Doctoral Fellowship Grant** 2020  
*I was granted a PhD fellowship by the Horizon 2020 Marie Skłodowska-Curie program (grant n. 801199)*
- **Undergraduate Honors Program: Scuola Normale Superiore** 2015  
*I was admitted to Scuola Normale Superiore, top math program in Italy ( $\approx 15$  students admitted per year)*

## Publications

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### Peer Reviewed Conference Proceedings

**Faster Estimation of the Average Degree of a Graph Using Random Edges and Structural Queries**  
with Deeparnab Chakrabarty, C. Seshadhri  
*Under review*

C12

<b>Feature Selection and Junta Testing are Statistically Equivalent</b> <i>with Nathaniel Harms, Caleb Koch</i> <i>Under review</i>	C11
<b>Approximating High-Dimensional Earth Mover's Distance as Fast as Closest Pair</b> <i>with Vincent Cohen-Addad, Rajesh Jayaram, Erik Waingarten</i> Symposium on Foundations of Computer Science (FOCS), 2025	C10
<b>New Statistical and Computational Results for Learning Junta Distributions</b> International Conference on Randomization and Computation (RANDOM), 2025	C9
<b>Sketched Lanczos uncertainty score: a low-memory summary of the Fisher information</b> <i>with Marco Miani, Søren Hauberg</i> Advances in Neural Information Processing Systems (NeurIPS), 2024	C8
<b>Online sorting and online TSP: randomized, stochastic, and high-dimensional</b> <i>with Mikkel Abrahamsen, Ioana Bercea, Jonas Klausen and László Kozma</i> European Symposium on Algorithms (ESA), 2024	C7
<b>Approximate Earth Mover's Distance in Truly-Subquadratic Time</b> <i>with Aviad Rubinfeld</i> Symposium on Theory of Computing (STOC), 2024	C6
<b>Multi-Swap <math>k</math>-Means++</b> <i>with Vincent Cohen-Addad, Silvio Lattanzi, Nikos Parotsidis</i> Advances in Neural Information Processing Systems (NeurIPS), 2023	C5
<b>Locally Uniform Hashing</b> <i>with Ioana Bercea, Jonas Klausen, Jakob Bæk Tejs Houen, Mikkel Thorup</i> Symposium on Foundations of Computer Science (FOCS), 2023	C4
<b>Online Sorting and Translational Packing of Convex Polygons</b> <i>with Anders Aamand, Mikkel Abrahamsen, Linda Kleist</i> Symposium on Discrete Algorithms (SODA), 2023	C3
<b>Better Sum Estimation via Weighted Sampling</b> <i>with Jakub Tetek</i> Symposium on Discrete Algorithms (SODA), 2022	C2
<b>Best Student Paper Award, invited to HALG 2022 and TALG special issue</b>	C1
<b>Online Packing to Minimize Area or Perimeter</b> <i>with Mikkel Abrahamsen</i> International Symposium on Computational Geometry (SoCG), 2021	C1

## Journal Publications

<b>Better Sum Estimation via Weighted Sampling</b> <i>with Jakub Tetek</i> Transactions on Algorithms (TALG)	J2
<b>An Optimal Algorithm to Find Champions of Tournament Graphs</b> <i>with Franco Maria Nardini, Roberto Trani, Rossano Venturini</i> IEEE Transactions on Knowledge and Data Engineering (TKDE)	J1

## Academic Service

- **Conference Review**

*ESA (2022, 2023, 2024), FOCS (2023), ICALP (2025), ISAAC (2024), ITCS (2024), NeurIPS (2025), SODA (2026), SOSA (2024), STOC (2025), SWAT(2024)*

- **Journal Review**

*Journal of Computational Geometry (JoCG)*

## Internships

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- **Stanford University** Feb 2023 – Aug 2023  
*I worked with Aviad Rubinstein on sublinear-time matching algorithms*
- **Google Research** Oct 2022 – Dec 2022  
*I worked on designing, analyzing and implementing clustering algorithms*
- **Quantitative Investment Internship, Société Générale** Aug 2019 – Oct 2019  
*I worked on implementing efficient algorithms for optimal execution.*

## Teaching and Leadership

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- **Teaching Assistant, Copenhagen University** 2021 – 2022  
*I served twice as T.A. for the “Randomized Algorithm” graduate course at Copenhagen University*
- **Scout Leader Volunteer** 2017 – 2020  
*I volunteered as a Scout leader, managing a troop of about 30 teenagers*