Joel Daniel Andersson

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Research interests

Differential privacy, online algorithms, streaming algorithms, linear algebra

Education

2022- PH.D. in Computer Science, University of Copenhagen
Topic: *differentially private algorithms under continual observation*
Advisor: *Rasmus Pagh*
Expected thesis hand-in date: August 31st 2025

2020 M.SC. in Engineering Physics, Lund University
GPA: 3.93 / 4.0
Relevant coursework: algorithms, optimization, linear algebra, real analysis, combinatorics

2017-2018 Exchange year. University of California, San Diego
Formally enrolled as a CS student. Studied algorithms, complexity and probability theory.

Professional experience

2020-2022 Ericsson AB – Lund, Sweden
Software Engineer
Implemented protocols in C for the 5G Physical Layer in base stations.

2019-2020 CERN – Geneva, Switzerland
Technical Student (salaried 14-month internship while writing my master's thesis)
Designed a framework in Python for first-order closed orbit analysis in synchotrons.

2018 CERN – Geneva, Switzerland
openlab Summer Student
Systematized the comparison of beam tracking codes and fixed identified bugs.

2016, 2017 Qlik AB – Lund, Sweden
Summer Software Engineering Intern
Revamped a test framework and automated documentation generation.

Grants, honours & awards

2017 Gull & Stellan Ljungberg Foundation Scholarship
2014 Hvitfeldtska Trust Scholarship
2014 Honorable mention in International Physics Olympiad
2014 Fifth place in Wallenberg (Swedish national) Physics Price Competition

Publications

Authors are listed in alphabetical order by default. First-authors who are first by contribution have a "*" next to their name.

Peer-reviewed publications

2025 · **J. D. Andersson**, Rasmus Pagh, Teresa Anna Steiner and Sahel Torkamani. "Count on Your Elders: Laplace vs Gaussian Noise". *Accepted to Symposium on Foundations of Responsible Computing (FORC), 2025*. [arXiv]
· **J. D. Andersson** and Rasmus Pagh. "Streaming Private Continual Counting via Binning". *Accepted to IEEE Conference on Secure and Trustworthy Machine Learning (SaTML), 2025*. [arXiv]
2024 · **J. D. Andersson**, Monika Henzinger, Rasmus Pagh, Teresa Anna Steiner and Jalaj Upadhyay. "Continual Counting with Gradual Privacy Expiration". *NeurIPS, 2024*. [arXiv]
2023 · **J. D. Andersson** and Rasmus Pagh. "A Smooth Binary Mechanism for Efficient Private Continual Observation". *NeurIPS, 2023*. [arXiv] [proceedings] [poster + 5 min video]
2019 · Riccardo De Maria* et al. "SixTrack V and runtime environment". *International Journal of Modern Physics A 34 (36), 2019*. [link]
· Riccardo De Maria* et al. "SixTrack Version 5: Status and New Developments". *Journal of Physics: Conference Series 1350 (1), 2019*. [link]

Other publications

2020 · **J. D. Andersson**, Riccardo De Maria and Davide Gamba "Orbit Correction Studies on the HL–LHC Layout and Optics V1.5". *Technical report, CERN*. [link]
· **J. D. Andersson** (advisors: Davide Gamba and Alexandros Sopasakis). "A Linear Framework for Orbit Correction in the High-Luminosity Large Hadron Collider". *Master's thesis*. [link]

Talks

2024 · Theory Lunch Talk at BARC. 30-minute whiteboard talk on the FOCS'24 paper "Efficient and Near-Optimal Noise Generation for Streaming Differential Privacy" by Krishnamurthy Dvijotham, H. Brendan McMahan, Krishna Pillutla, Thomas Steinke and Abhradeep Thakurta. October 22, 2024.
2023 · ARCO 2023 at SDU. 20-minute talk on "A Smooth Binary Mechanism for Efficient Private Continual Observation". November 24, 2023.
· Theory Lunch Talk at BARC. 30-minute whiteboard talk on connection between continual counting and matrix mechanisms. November 7, 2023.
· Google Privacy Seminar hosted by Thomas Steinke. 45-minute talk on "A Smooth Binary Mechanism for Efficient Private Continual Observation". August 30, 2023.

Teaching

2022-2025 Teaching assistant for the first-year graduate class in algorithms: Advanced Algorithms and Data Structures (AADS) at Univeristy of Copenhagen. Responsibilities included leading exercise classes, preparing the exam and grading hand-ins. [course description]

Academic service

2023 Organized the biannual ARCO (Algorithmic Research Cooperation around Øresund) event at University of Copenhagen together with Jacob Holm. [homepage]

Media appearances

2024 Media article(s) on "A Smooth Binary Mechanism for Efficient Private Continual Observation". English press release from KU, and Danish article in Dagens Pharma.

2023 Contributed to SCIENC KU's *Christmas Calendar*. Recorded a 1-minute video, sketching out a connection between the Traveling Salesman Problem and Santa's predicament around Christmas.

Other skills

Coding Python, C, C++, Java, MATLAB, LaTeX, bash, git

Languages Swedish (*native*), English (*fluent*), Danish (*B2*), French (*B1*)

Running 5 kilometers (19:15), half-marathon (1:35:31), marathon (3:32:57)

Last updated: December 31, 2024