

David Persson

Academic positions

New York University	Courant Instructor	September 2024 - Current
Flatiron Institute <i>Mentor: Alex Barnett</i>	Flatiron Research Fellow	September 2024 - Current

Education

École Polytechnique Fédérale de Lausanne <i>Advisor: Prof. Daniel Kressner</i>	Ph.D. Mathematics	September 2020 - July 2024
New York University <i>Advisor: Prof. Christopher Musco</i>	Visiting research scholar	February 2023 - July 2023
University College London <i>MSci thesis advisor: Prof. Timo Betcke</i> <i>Awarded First Class Honours</i>	MSci Mathematics with Economics	October 2016 - August 2020
National University of Singapore <i>CAP: 4.85/5</i>	Exchange student	August 2018 - May 2019
Katedralskolan Linköping <i>Grade: 42/45</i>	International Baccalaureate	August 2012 - June 2015

Publications and current work

Journal/Conference articles

- D. Persson, N. Boullé, and D. Kressner, *Randomized Nyström approximation of non-negative self-adjoint operators*, SIAM Journal on Mathematics of Data Science (2025). <https://epubs.siam.org/doi/abs/10.1137/24M165082X>
- T. Chen, F. D. Keles, and D. Halikias, C. Musco, C. Musco, D. Persson, *Near-optimal hierarchical matrix approximation from matrix-vector products*, in Proceedings of the Annual ACM-SIAM Symposium on Discrete Algorithms (SODA), 2025. <https://epubs.siam.org/doi/abs/10.1137/1.9781611978322.871>
- D. Persson, R. A. Meyer, and C. Musco, *Algorithm-agnostic low-rank approximation of operator monotone matrix functions*, SIAM Journal on Matrix Analysis and Applications (2025). <https://epubs.siam.org/doi/abs/10.1137/23M1619435>
- D. Persson and D. Kressner, *Randomized low-rank approximation of monotone matrix functions*, SIAM Journal on Matrix Analysis and Applications (2023). <https://epubs.siam.org/doi/abs/10.1137/22M1523923>
- D. Persson, A. Cortinovis, and D. Kressner, *Improved variants of the Hutch++ algorithm for trace estimation*, SIAM Journal on Matrix Analysis and Applications (2022). <https://epubs.siam.org/doi/abs/10.1137/21M1447623>

Preprints

- D. Kressner, D. Persson, and A. Uschmajew, *On the randomized SVD in infinite dimensions (2025)*. <https://arxiv.org/pdf/2506.06882>
- N. Amsel, T. Chen, F.D. Keles, D. Halikias, C. Musco, C. Musco, and D. Persson, *Quasi-optimal hierarchically semi-separable matrix approximation (2025)*. <https://arxiv.org/pdf/2505.16937>
- N. Amsel, D. Persson, C. Musco, and R.M. Gower, *The Polar Express: Optimal matrix-sign methods and their application within the Muon method, (2025)*. <https://arxiv.org/pdf/2505.16932>
- D. Persson, T. Chen, and C. Musco, *Randomized block-Krylov subspace methods for low-rank approximations of matrix functions, (2025)*. <https://arxiv.org/pdf/2502.01888>

Awards

Susan N. Brown Price (UCL) <i>Awarded for the best performance in applied mathematics.</i>	<i>August 2020</i>
UCL Mathematical & Physical Sciences Faculty Dean's List <i>For being in the top 5% of graduating students.</i>	<i>August 2020</i>
Erasmus+ Traineeship Grant <i>Received funding to conduct research at Karolinska Institutet.</i>	<i>May 2019</i>
EPSRC Vacation Bursary <i>Received funding to conduct research at UCL.</i>	<i>May 2018</i>
UCL Department of Mathematics First Year Undergraduate Prize <i>Awarded for excellent exam results.</i>	<i>August 2017</i>

Teaching experience

NYU

- Applied Partial Differential Equations, Spring 2025
- Mathematics for Economics I, Fall 2024

École Polytechnique Fédérale de Lausanne

- MSc Thesis co-supervision, Viacheslav Karpil (*Trace estimation of integral operators*), Spring 2024
- Principal TA, MATH-105 (b) Advanced Analysis II, Spring 2024
- Organiser and lecturer, MATH-646 Reading group in Quantum Computing, Fall 2023
- Principal TA, MATH-110 (a) Advanced Linear Algebra, Fall 2023
- Principal TA, MATH-403 Low-rank approximation techniques, Fall 2022
- Semester project co-supervision, Matthias Zeller (*Randomized algorithms for Gaussian process regression*), Spring 2022
- Principal TA, MATH-202 (c) Analysis III, Spring 2022
- MSc Thesis co-supervision, Tingting Ni (*On the approximation of vector-valued functions by samples*), Fall 2021
- Principal TA, MATH-458 Programming concepts in scientific computing, Fall 2021
- Principal TA, MATH-250 Numerical Analysis, Spring 2021
- Semester project co-supervision, Claudio Boscolo Cegion (*Randomized methods for compressing matrices with hierarchical low-rank structure*), Fall 2020

- Principal TA, MATH-101 (en) Analysis I, Fall 2020

Talks

EPFL Theory coffee seminar <i>Near-optimal hierarchical matrix approximation from matrix-vector products (talk)</i>	<i>March 2025</i> Lausanne, Switzerland
SU & KTH Numerical analysis seminar <i>Near-optimal hierarchical matrix approximation from matrix-vector products (talk)</i>	<i>January 2025</i> Stockholm, Sweden
SIAM Conference on Applied Linear Algebra <i>Algorithm-agnostic low-rank approximation of operator monotone matrix functions (talk)</i>	<i>May 2024</i> Paris, France
The $f(A)$bulous workshop on matrix functions and exponential integrators <i>Randomized low-rank approximation of monotone matrix functions (talk)</i>	<i>September 2023</i> Magdeburg, Germany
Perspectives on Matrix Computations: TCS meets Numerical Analysis <i>Randomized low-rank approximation of monotone matrix functions (talk)</i>	<i>March 2023</i> Banff, Canada
Swiss Numerics Day <i>Randomized low-rank approximation of monotone matrix functions (poster)</i>	<i>September 2022</i> Zurich, Switzerland
ApplMath22 <i>Randomized low-rank approximation of monotone matrix functions (poster)</i>	<i>September 2022</i> Brijuni, Croatia
Gene Golub SIAM Summer School on Financial Analytics <i>Improved variants of the Hutch++ algorithm for trace estimation (poster)</i>	<i>August 2022</i> L'Aquila, Italy
EPFL MATHICSE retreat <i>Improved variants of the Hutch++ algorithm for trace estimation (talk)</i>	<i>June 2022</i> Villars, Switzerland
Conference on random matrix theory and numerical linear algebra <i>Improved variants of the Hutch++ algorithm for trace estimation (poster)</i>	<i>June 2022</i> Seattle, USA
17th Copper Mountain Conference on Iterative Methods (Virtual) <i>Improved variants of the Hutch++ algorithm for trace estimation (talk)</i>	<i>March 2022</i> Copper Mountain, USA
Matrix equations and tensor techniques IX <i>Improved variants of the Hutch++ algorithm for trace estimation (talk)</i>	<i>September 2021</i> Perugia, Italy

Professional experience

Karolinska Institutet	Visiting undergraduate research	May 2019 - September 2019
<ul style="list-style-type: none"> ▪ Investigated optimization methods to determine metabolic fluxes from measurement data. ▪ Developed GAMS software to determine metabolic fluxes from measurement data. ▪ Supervised by Prof. Roland Nilsson. 		
University College London	Undergraduate research	June 2018 - August 2018
<ul style="list-style-type: none"> ▪ Investigated a numerical method to solve the obstacle problem. ▪ Supervised by Prof. Erik Burman. 		

Programming languages

MATLAB, Python, Julia, C++, R, GAMS, STATA.

Languages

Swedish (native), English (fluent), German (C1 level).