

*Courant Institute of Mathematical Sciences  
New York University  
251 Mercer St, New York, NY 10012, USA*

*Flatiron Institute  
Simons Foundation  
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# David Persson

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## Research interests

Numerical analysis, numerical linear algebra, randomized algorithms, theoretical computer science, foundations of machine learning

## Professional appointments

Sep. 2024 – date **Courant Instructor (Assistant professor)**, *New York University*,  
Courant Institute of Mathematical Sciences, USA

Sep. 2024 – date **Flatiron Research Fellow**, *Simons Foundation*, Flatiron Institute (CCM),  
USA  
Mentor: Alex Barnett

## Education

Sep. 2020–Jun. 2024 **Ph.D. Mathematics**, *EPFL*, Chair of Numerical Algorithms and High-  
Performance Computing (ANCHP), Switzerland  
Supervisor: Daniel Kressner

Feb. 2023 – Jun. 2023 **Visiting research scholar**, *New York University*, USA  
Mentor: Christopher Musco

Oct. 2016–Aug. 2020 **MSci Mathematics with Economics**, *University College London*, UK,  
First Class Honours  
Advisor: Timo Betcke

May. 2019–Sep. 2019 **Visiting research student**, *Karolinska Institutet*, Sweden  
Supervisor: Roland Nilsson

Aug. 2018–May. 2019 **Exchange student**, *National University of Singapore*, Singapore, CAP:  
4.85/5

May. 2018–Aug. 2018 **EPSRC Undergraduate Research**, *University College London*, UK  
Supervisor: Erik Burman

## Awards

Jun. 2025 **IMA Leslie Fox Prize for Numerical Analysis**, *2nd prize*  
For work on low-rank approximation of monotone matrix functions

- Aug. 2020 **Susan N. Brown Price, University College London**  
Awarded for the best performance in applied mathematics.
- Aug. 2020 **UCL Mathematical & Physical Sciences Faculty Dean's List**  
For being in the top 5% of graduating students.
- May 2019 **Erasmus+ Traineeship Grant**  
Received funding to conduct research at Karolinska Institutet.
- May 2019 **EPSRC Vacation Bursary**  
Received funding to conduct research at UCL.
- Aug. 2017 **UCL Department of Mathematics First Year Undergraduate Prize**  
Awarded for excellent exam results.

## Publications

### Preprints

- [1] N. Amsel, P. Avi, T. Chen, F. D. Keles, C. Hegde, C. Musco, C. Musco, and D. Persson, *Query efficient structured matrix learning*, *arXiv preprint arXiv:2507.19290*, 2025.
- [2] D. Kressner, D. Persson, and A. Uschmajew, *On the randomized SVD in infinite dimensions*, *arXiv preprint arXiv:2506.06882*, 2025.
- [3] N. Amsel, T. Chen, F. D. Keles, D. Halikias, C. Musco, C. Musco, and D. Persson, *Quasi-optimal hierarchically semi-separable matrix approximation*, *arXiv preprint arXiv:2505.16937*, 2025.
- [4] N. Amsel, D. Persson, C. Musco, and R. M. Gower, *The Polar Express: Optimal matrix sign methods and their application to the Muon algorithm*, *arXiv preprint arXiv:2505.16932*, 2025.
- [5] D. Persson, T. Chen, and C. Musco, *Randomized block-Krylov subspace methods for low-rank approximation of matrix functions*, *arXiv preprint arXiv:2502.01888*, 2025.

### Articles

- [6] D. Persson, N. Boullé, and D. Kressner, *Randomized Nyström approximation of non-negative self-adjoint operators*, *SIAM Journal on Mathematics of Data Science*, vol. 7, no. 2, pp. 670–698, 2025.
- [7] 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*, vol. 46, no. 1, pp. 1–21, 2025.
- [8] T. Chen, F. D. Keles, D. Halikias, C. Musco, C. Musco, and D. Persson, *Near-optimal hierarchical matrix approximation from matrix-vector products*, in *Proceedings of the 2025 Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, SIAM, Philadelphia, PA, 2025, pp. 2656–2692.
- [9] D. Persson and D. Kressner, *Randomized low-rank approximation of monotone matrix functions*, *SIAM Journal on Matrix Analysis and Applications*, vol. 44, no. 2, pp. 894–918, 2023.

- [10] D. Persson, A. Cortinovis, and D. Kressner, *Improved variants of the Hutch++ algorithm for trace estimation*, *SIAM Journal on Matrix Analysis and Applications*, vol. 43, no. 3, pp. 1162–1185, 2022.

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## Talks

- Oct. 2025 **Simons Institute workshop on Linear Systems and Eigenvalue Problems**, Berkeley, USA  
Poster: Quasi-optimal Hierarchically semi-separable matrix approximation
- Jun. 2025 **IMA Leslie Fox Prize meeting**, Glasgow, UK  
Talk: Randomized low-rank approximation of monotone matrix functions
- Jun. 2025 **Conference on Random Matrix Theory and Numerical Linear Algebra II**, Seattle, USA  
Talk: Randomized Nyström approximation of non-negative self-adjoint operators
- Jun. 2025 **Householder Symposium XXII**, Ithaca, USA  
Talk: Randomized Nyström approximation of non-negative self-adjoint operators
- Mar. 2025 **EPFL Theory Coffee Seminar**, Lausanne, Switzerland  
Talk: Near-optimal hierarchical matrix approximation from matrix-vector products
- Jan. 2025 **SU & KTH Numerical Analysis Seminar**, Stockholm, Sweden  
Talk: Near-optimal hierarchical matrix approximation from matrix-vector products
- May 2024 **SIAM Conference on Applied Linear Algebra**, Paris, France  
Talk: Algorithm-agnostic low-rank approximation of operator monotone matrix functions
- Sep. 2023 **The  $f(A)$ bulous Workshop on Matrix Functions and Exponential Integrators**, Magdeburg, Germany  
Talk: Randomized low-rank approximation of monotone matrix functions
- Mar. 2023 **Perspectives on Matrix Computations: TCS meets Numerical Analysis**, Banff, Canada  
Talk: Randomized low-rank approximation of monotone matrix functions
- Sep. 2022 **Swiss Numerics Day**, Zurich, Switzerland  
Poster: Randomized low-rank approximation of monotone matrix functions
- Sep. 2022 **ApplMath22**, Brijuni, Croatia  
Poster: Randomized low-rank approximation of monotone matrix functions
- Aug. 2022 **Gene Golub SIAM Summer School on Financial Analytics**, L'Aquila, Italy  
Poster: Improved variants of the Hutch++ algorithm for trace estimation
- Jun. 2022 **EPFL MATHICSE Retreat**, Villars, Switzerland  
Talk: Improved variants of the Hutch++ algorithm for trace estimation
- Jun. 2022 **Conference on Random Matrix Theory and Numerical Linear Algebra**, Seattle, USA  
Poster: Improved variants of the Hutch++ algorithm for trace estimation

- Mar. 2022 **17th Copper Mountain Conference on Iterative Methods (virtual)**,  
Copper Mountain, USA  
Talk: Improved variants of the Hutch++ algorithm for trace estimation
- Sep. 2021 **Matrix Equations and Tensor Techniques IX**, Perugia, Italy  
Talk: Improved variants of the Hutch++ algorithm for trace estimation

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## Teaching

### Supervision

- Fall 2025 **Ian Taylor (BSc)**, NYU, Semester project
- Spring 2024 **Viacheslav Karpil (MSc)**, EPFL, MSc Thesis (*Trace estimation of integral operators*)  
Co-supervised with Daniel Kressner
- Spring 2022 **Matthias Zeller (MSc)**, EPFL, Semester project (*Randomized algorithms for Gaussian process regression*)  
Co-supervised with Daniel Kressner
- Fall 2021 **Tingting Ni (MSc)**, EPFL, MSc Thesis (*On the approximation of vector-valued functions by samples*)  
Co-supervised with Daniel Kressner
- Fall 2020 **Claudio Boscolo (MSc)**, EPFL, Semester project (*Randomized methods for compressing matrices with hierarchical low-rank structure*)  
Co-supervised with Daniel Kressner

### Instructor

- Fall 2025 **Ordinary Differential Equations**, NYU, Undergraduate
- Spring 2025 **Applied Partial Differential Equations**, NYU, Undergraduate
- Fall 2024 **Mathematics for Economics I**, NYU, Undergraduate
- Fall 2023 **Reading group in Quantum Computing**, EPFL, Graduate  
Organizer and lecturer

### Teaching assistant

- Spring 2024 **Advanced Analysis II**, EPFL, Undergraduate  
Principal TA
- Fall 2023 **Advanced Linear Algebra**, EPFL, Undergraduate  
Principal TA
- Fall 2022 **Low-rank Approximation Techniques**, EPFL, Graduate  
Principal TA
- Spring 2022 **Analysis III**, EPFL, Undergraduate  
Principal TA
- Fall 2021 **Programming Concepts in Scientific Computing**, EPFL, Graduate  
Principal TA
- Spring 2021 **Numerical Analysis**, EPFL, Undergraduate  
Principal TA

Fall 2020 **Analysis I**, EPFL, Undergraduate  
Principal TA