Manu Upadhyaya

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GOOGLE SCHOLAR: google.com/citations?user=pqHlu8kAAAAJ

Education

2020–2025	**Ph.D. in mathematical optimization**, Lund University, Sweden (**GPA: pass/fail only**)
2018–2020	**M.Sc. in finance**, Lund University, Sweden (**GPA: 87.5% highest possible grade**)
2014–2020	**M.Sc. and Civ. Ing. in engineering physics**, Lund University, Sweden (**GPA: 5.0/5.0**)
2016–2017	**Study abroad**, University of California, Berkeley, USA (**GPA: 4.0/4.0**)
2011–2015	**B.Sc. in mathematics**, Lund University, Sweden (**GPA: 100% highest possible grade**)

Research experience

JUL 2020–SEP 2025	**Ph.D. student**, Department of Automatic Control, Lund University, Sweden **Funding:** Wallenberg AI, Autonomous Systems and Software Program. **Advisors:** Pontus Giselsson and Sebastian Banert. Focused on Lyapunov-type analyses of first-order algorithms for structured optimization and inclusion problems; combined new theory with computer-aided tools to automate analyses, tighten convergence/complexity guarantees, and guide algorithm design.
SEP 2024–FEB 2025	**Visiting researcher**, Inria, Paris, France Hosted by Adrien Taylor as part of the Sierra team.
JUN 2018–AUG 2018	**Visiting student researcher**, ETH Zürich, Basel, Switzerland Conducted research on the stability of stochastic biochemical reaction networks under the supervision of Ankit Gupta in the Control Theory and Systems Biology Laboratory, led by Mustafa Khammash.
MAY 2017–AUG 2017	**Visiting student researcher**, University of California, Berkeley, USA Worked on tactile sensing in robotic manipulation using deep neural networks under the supervision of Roberto Calandra in Sergey Levine's research group, resulting in a paper accepted to CoRL 2017.
JUN 2016–AUG 2016	**Research assistant**, Research Institutes of Sweden, Stockholm, Sweden Developed and evaluated finite element models for paperboard container manufacturing using Abaqus under the supervision of Mikael Nygårds.

Professional experience

AUG 2019–JAN 2020	**Master thesis student**, Lynx Asset Management AB, Stockholm, Sweden Designed a data-driven method for covariance matrix regularization specifically tailored for portfolio optimization, under the supervision of Tobias Rydén. Technologies used: Julia, MATLAB.
JUN 2019–JUL 2019	**Quantitative developer intern**, OQAM AB, Malmö, Sweden Contributed to the development of data-driven solutions and automation. Technologies used: Docker, Python, Selenium, SQLAlchemy, Flask, MariaDB, RabbitMQ.

Teaching experience

Teaching assistant, Lund University, Sweden

Courses:

- Network dynamics [2022, 2025]
- Optimization for learning [2020, 2021, 2022, 2023, 2024]
- Modeling and learning from data [2023]
- Deep learning [2021, 2023]
- Project in systems, control, and learning [2021]
- Automatic control, basic course [2020]
- Programming in Java [2015]

Thesis supervisor, Lund University, Sweden

Supervised master's thesis:

- Oscar Gummesson Atroshi and Osman Sibai: *Deep hedging of CVA* [2024].
  Co-supervised with Magnus Wiktorsson (Lund University) and Shengyao Zhu (Nordea Markets).

Publications

Preprints

[1] **Manu Upadhyaya**, Puya Latafat, and Pontus Giselsson. *A Lyapunov analysis of Korpelevich's extragradient method with fast and flexible extensions*. 2025. arXiv: `2502.00119` [math.OC]. Accepted for publication in *Mathematical Programming*.

[2] **Manu Upadhyaya**, Adrien B. Taylor, Sebastian Banert, and Pontus Giselsson. *AutoLyap: A Python package for computer-assisted Lyapunov analyses for first-order methods*. 2025. arXiv: `2506.24076` [math.OC]. URL: `https://autolyap.github.io`.

Conference papers

[3] Roberto Calandra, Andrew Owens, **Manu Upadhyaya**, Wenzhen Yuan, Justin Lin, Edward H. Adelson, and Sergey Levine. "The feeling of success: Does touch sensing help predict grasp outcomes?" In: *Conference on Robot Learning (CoRL)*. 2017.

Journal articles

[4] Sebastian Banert, **Manu Upadhyaya**, and Pontus Giselsson. "The Chambolle–Pock method converges weakly with $\theta > 1/2$ and $\tau\sigma\|L\|^2 < 4/(1 + 2\theta)$". In: *Optimization Letters* (2025). DOI: `10.1007/s11590-025-02250-0`.

[5] **Manu Upadhyaya**, Sebastian Banert, Adrien B. Taylor, and Pontus Giselsson. "Automated tight Lyapunov analysis for first-order methods". In: *Mathematical Programming* 209 (2025), pp. 133–170. DOI: `10.1007/s10107-024-02061-8`.

Theses

[6] **Manu Upadhyaya**. "Lyapunov analyses for first-order methods: Theory, automation, and algorithm design". PhD thesis. Lund University, 2025. URL: `https://lup.lub.lu.se/record/a006046c-9dc6-446b-b625-f129587c9674`.

[7] **Manu Upadhyaya**. "Covariance matrix regularization for portfolio selection: Achieving desired risk". Master's thesis. Lund University, 2020. URL: `http://lup.lub.lu.se/student-papers/record/9005476`.

Presentations

- 8th International Conference on Continuous Optimization (ICCOPT 2025), Los Angeles, USA. July 2025.
- 22nd Conference on Advances in Continuous Optimization (EUROPT 2025), Southampton, UK. June–July 2025.
- Swedish Control Conference 2025, Lund, Sweden. June 2025.

- Seminar at the Department of Automatic Control, Lund University, Lund, Sweden. March 2025.
- Seminar at Inria Paris, Paris, France. October 2024.
- 33rd European Conference on Operational Research (EURO 2024), Copenhagen, Denmark. June–July 2024.
- 21st Conference on Advances in Continuous Optimization (EUROPT 2024), Lund, Sweden. June 2024.
- 20th Conference on Advances in Continuous Optimization (EUROPT 2023), Budapest, Hungary. August 2023.
- SIAM Conference on Optimization (OP23), Seattle, USA. May–June 2023.
- Seminar at the Department of Automatic Control, Lund University, Lund, Sweden. May 2023.
- SIAM Conference on Computational Science and Engineering (CSE23), Amsterdam, Netherlands. February–March 2023.
- 1st Workshop on Performance Estimation Problems, UCLouvain, Belgium. February 2023.
- Seminar at the Department of Automatic Control, Lund University, Lund, Sweden. June 2022.
- Seminar at the Department of Automatic Control, Lund University, Lund, Sweden. June 2021.

Professional service

Conference organization

- Stream organizer for the 22nd Conference on Advances in Continuous Optimization (EUROPT 2025), University of Southampton, Southampton, UK. June 29–July 2, 2025.
- Co-organizer and stream organizer for the 21st Conference on Advances in Continuous Optimization (EUROPT 2024), Lund University, Lund, Sweden. June 26–28, 2024.

Peer reviewing: Journals

- IEEE Transactions on Automatic Control
- Transactions on Machine Learning Research

Peer reviewing: Conferences

- Learning for Dynamics & Control (L4DC), 2024

Awards and honors

- **2015–2025** – Scholarship awarded by Lund University (ten times).
- **2024, 2025** – The Royal Physiographic Society of Lund Scholarship (twice).
- **2025** – Ericsson Research Foundation Grant.
- **2024** – Skånska Ingenjörsklubbens Stiftelse Scholarship.
- **2018** – Akademiska Föreningens Stipendienämnd Scholarship.
- **2017** – Carl Erik Levins Stiftelse Scholarship (twice).
- **2017** – Gustaf Söderbergs Stiftelse Scholarship.
- **2016** – Civilingenjören Hakon Hanssons Stiftelse Scholarship.
- **2016** – Winner of Accenture IT Case Challenge, Stockholm.

Skills

Programming languages

- Proficient: Python
- Experience with: Haskell, Java, Julia, MATLAB, R, Scala, Spark, SQL