Jakob Nylöf

Homepage
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Stockholm, Sweden

Interests

Control Theory, Reinforcement Learning, Stochastic Control, Optimization, Quantum Computing

Education

KTH Royal Insitute of Technology — Stockholm, Sweden
BSc in Engineering Physics & MSc in Mathematics — *August 2018 - June 2024 (expected)*

- Modules: Advanced Real Analysis, Advanced Algebra, Topology, Fourier Analysis, Calculus of Variations, Mathematical Systems Theory, Optimization & Optimal Control Theory
- GPA: 4.78/5
- Master thesis: Q-learning in Continuous Time
  Supervisor: Prof. Boualem Djehiche

ETH Zürich — Zürich, Switzerland
Exchange Semester — *Feb 2022 - Aug 2022*

- Modules: Advanced Quantum Information Theory, Quantum Error Correction, Quantum Information Processing, Computational Quantum Physics, German

Vasaskolan — Gävle, Sweden
Upper Secondary Degree From the Natural Science Programme with Specialization in Mathematics Aug 2015 - Jun 2017

- GPA: 22.3/22.5

Academic Positions

University of Michigan — Ann Arbor, Michigan, USA
Electrical Engineering and Computer Science Department — *Jul - Aug 2023*

- Research on minimizing sensor-to-actuator communications for output feedback control leading to publication [1]
- Supervisors: Prof. Necmiye Ozay & Dr. Antoine Aspeel
- Collaborator: Prof. Jing Shuang (Lisa) Li

KTH Royal Institute of Technology — Stockholm, Sweden
Division of Decision and Control Systems — *Jun - Oct 2021*

- Research on distributed privacy-preserving resource allocation using quantized averaging leading to publication [2]
- Supervisors: Prof. Karl Henrik Johansson, Dr. Apostolos Rikos & Prof. Sebin Gracy

Publications

[1] Antoine Aspeel, **Jakob Nylof**, Jing Shuang Li, and Necmiye Ozay. A low-rank approach to minimize sensor-to-actuator communication in finite-horizon output feedback. *IEEE Control Systems Letters*, 7:3609–3614, 2023 (link)

[2] Apostolos I. Rikos, **Jakob Nylöf**, Sebin Gracy, and Karl H. Johansson. Distributed optimal allocation with quantized communication and privacy-preserving guarantees. *IFAC-PapersOnLine*, 55(41):64–70, 2022. 4th IFAC Workshop on Cyber-Physical and Human Systems CPHS 2022 (link)

Awards

- 2021-2022 Ingenjör Ernst Johnsson Scholarship of Academic Excellence (awarded 2 semesters), KTH Royal Institute of Technology
- 2022 Erasmus+ Scholarship, KTH Royal Institute of Technology
- 2017 Ljungbergsfonden Scholarship of Academic Excellence, Vasaskolan
- 2017 Awarded participation in the Sonja Kovalevsky-days for high-school students interested in mathematics
- 2012 Awarded national best science fair project at Internationella Engelska Skolan (Topic: Flight of paper Airplanes)

Industry Experience

Alleima (formerly Sandvik Materials Technology) Sandviken, Sweden
Internship *Sep - Dec 2017*

- Internship at the Department of Transports at Alleima's industrial site.
- Improved water management strategies by studying linear regression models for estimating water reservoir levels.
- Mapped out the positions of industrial vehicles on the industrial site.

Billerud Korsnäs Gävle, Sweden
Summer Job *Summers 2018 & 2019*

- Managed quality control procedures for paper pulp and carton production in a laboratory setting.

Additional Experience

The REXUS Programme - Rocket Experiments for University Students Stockholm, Sweden
Bachelor Thesis & Team Member *Jan 2021 - Feb 2022*

- Bachelor thesis at KTH: Design of a high altitude glider for returning a free falling module from space back to Earth.
- Member of KTH's REXUS team responsible for control and system modelling.

Physics Chapter International Committee Stockholm, Sweden
Marketing Manager *Aug 2020 - Dec 2020*

- Marketing and planning of events for international exchange students at KTH.

Diploma Project From Upper Secondary School Gävle, Sweden
May - Jun 2017

- Reproduction of the Millikan oil-drop experiment in which an estimation of the elementary charge $e = 1.60217663 \times 10^{-19}\ C$ was made.

Skills

Courses from Coursera

- Neural Networks and Deep Learning, certificate
- Unsupervised Learning, Recommenders, Reinforcement Learning, certificate
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization, certificate

Computer Skills

Programming: Python (including optimization packages such as cvxpy), Matlab, Bash
Software: Comsol, Simulink, XFLR5, Simscale, CAD, LaTeX

Languages: Swedish (native), English (fluent), French (intermediate), German (beginner)

Other Activities

- I've helped organize the reception of new students KTH.
- I've been a scout-leader and organized hikes and weekly meetings for other scouts.
- In my free time, I play electric guitar and really enjoy outdoor activities such as hiking and skiing.

References

Prof. Necmyie Ozay — University of Michigan
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Prof. Karl Henrik Johansson — KTH Royal Institute of Technology
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Prof. Henrik Sandberg — KTH Royal Institute of Technology
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Dr. Antoine Aspeel — University of Michigan
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Prof. Sebin Gracy — South Dakota Mines
Department of Electrical Engineering and Computer Science — *Rapid City, South Dakota, USA*
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Prof. Jing Shuang (Lisa) Li — University of Michigan
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