RobertMattila, Ph.D.

Researcher | KTH Royal Institue of Technology

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Awards
- KTH-EE Scholarship of Excellence (1 MSEK)
- H. Göransson's Scholarship for outstanding grades
- KTH Student Scholarship for outstanding grades

Programming
- Matlab, Python, Julia
- Algorithm implementation
- fast.ai: Practical Deep Learning for Coders, v3

Mathematics
- Hidden Markov models
- Statistics, machine learning, optimization

Languages
Swedish ★★★★★
English ★★★★★
Spanish ★★★☆☆

Computers
- OSX, Linux, Windows
- LaTeX, Git

Profile

I received my Ph.D. degree in June 2020 based on my research on inference and control of stochastic dynamic systems (e.g., hidden Markov models). My research has been published in leading venues for machine learning and artificial intelligence (NeurIPS, ICML), as well those for signal processing and control theory (SPL, TSP, CDC).

During my Ph.D., I have learned: • independent research and problem solving, • teaching and presenting for an audience, • written communication, • time-management, • critical thinking, • algorithm implementation and evaluation (in Python, Matlab and Julia).

I am interested in opportunities related to machine learning, data analytics and their future applications in real-world scenarios – for example, next-generation health-care and finance.

Publications (selected)

- **R. Mattila**, et al., "Inverse filtering for hidden Markov models with applications to counter-adversarial autonomous systems", in the *IEEE Transactions on Signal Processing*, 2020.
- **R. Mattila**, et al., "Fast and consistent learning of hidden Markov models by incorporating non-consecutive correlations", in the *International Conference on Machine Learning (ICML)*, 2020.
- **R. Mattila**, et al., "Inverse filtering for hidden Markov models", in *Advances in Neural Information Processing Systems* (NeurIPS), 2017.

Education and Research

2015 - 2020 **Ph.D. Degree** — KTH | Stockholm, Sweden
Hidden Markov Models: Identification, Inverse Filtering and Applications
Supervisors: Prof. Bo Wahlberg, Prof. Cristian Rojas
Courses: • Partially observed Markov decision processes • Game theory • Mathematical methods in signals, systems and control • Bayesian networks • Hybrid systems • Probabilistic verification and synthesis • Matrix algebra • Probability and random processes • Convex optimization • Stochastic control and optimization • Deep learning in data science • Optimal filtering

2019 **Visiting Researcher** — Cornell University | Ithaca, USA
Supervisor: Prof. Vikram Krishnamurthy

2010 - 2015 **M.Sc. in Engineering (sv. Teknisk Fysik)** — KTH | Stockholm, Sweden
B.Sc. *Engineering Physics* **M.Sc.** *Systems, Control and Robotics*
GPA: 5.0/5.0, 300 ECTS

2014 **Research Internship (SURF)** — Caltech | California, USA
Supervisors: Prof. Richard Murray, Prof. Yilin Mo

2013 **Erasmus Exchange Studies** — UCM | Madrid, Spain
GPA: 8.1/10.0 (Courses in Spanish)

Teaching

At KTH, I have helped teach courses on:

- Reinforcement learning (M.Sc., 120 students)
- Stochastic control and optimization (M.Sc.)
- Automatic control (B.Sc.)

(August 11, 2020)