

# Alexander Aurell – Curriculum Vitae

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alexarell@gmail.com • alexarell.github.io

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## Academic Appointments

Postdoctoral Research Associate  
**Princeton University, ORFE Department**  
PI: Prof. René Carmona

PRINCETON, NJ, USA  
Mar 2020 – Jul 2021

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## Education

Ph.D. in Applied and Computational Mathematics  
**KTH Royal Institute of Technology, Department of Mathematics**  
Advisor: Prof. Boualem Djehiche, Co-advisor: Prof. Xiaoming Hu  
Thesis title: Topics in the mean-field type approach to pedestrian crowd modeling and conventions

STOCKHOLM, SWEDEN  
Oct 2014 – Dec 2019

M.Sc. in Engineering Physics  
**KTH Royal Institute of Technology**  
2013: Exchange studies at EPFL, Lausanne, Switzerland  
Thesis title: The SVI implied volatility model and its calibration

STOCKHOLM, SWEDEN  
Aug 2012 – Sep 2014

B.Sc. in Engineering Physics  
**KTH Royal Institute of Technology**  
Thesis title: Sound wave simulation for computer games

STOCKHOLM, SWEDEN  
Aug 2009 – Jul 2012

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## Industry Experience

Silo AI  
**Senior AI Scientist**  
Same as in my AI Scientist role but with extended responsibilities around project management and technical sales support. Keywords that reflect my projects: *Supply chain management, time series forecasting, radio access network*

STOCKHOLM, SWEDEN  
Sep 2022 – ongoing

**AI Scientist**  
Consulting in AI with a focus on nordic industry. Delivering projects in teams and single handedly. Development in Python. Keywords that reflect my projects: *Predictive maintenance, supply chain management, multivariate anomaly detection, knowledge-based learning, deep learning, reinforcement learning*

NOV 2021 – SEP 2022

ORC Group  
**Quantitative Analyst Intern (M.Sc. Thesis Project)**  
Developed and implemented a pricing model for stock options with the R&D team.

STOCKHOLM, SWEDEN  
Jan 2014 – Sep 2014

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## Research Papers

### Publications

Aurell, A., Carmona, R. & Laurière, M. *Stochastic Graphon Games: II. The Linear-Quadratic Case*. Appl Math Optim (2022).

Aurell, A., Carmona, R., Dayanikli, G. & Laurière, M. *Optimal incentives to mitigate epidemics: A Stackelberg mean field game approach*. SIAM Journal on Control and Optimization 0 (2022): S294-S322.

Aurell, A., Carmona, R., Dayanikli, G., & Laurière, M. *Finite State Graphon Games with Applications to Epidemics*. Dynamic Games and Applications (2022): 1-33

Aurell, A. & Djehiche, B. *Behavior near walls in the mean field approach to crowd motion*. SIAM Journal on Applied Mathematics 80.3 (2020): 1153-1174

Aurell, A. & Djehiche, B. *Modeling tagged pedestrian motion: A mean-field type game approach*. Transportation Research Part B: Methodological 121 (2019): 168-183

Aurell, A. *Mean-Field Type Games between Two Players Driven by Backward Stochastic Differential Equations*. Games, 9.4 (2018): 88

Aurell, A. & Djehiche, B. *Mean-field type modeling of nonlocal crowd aversion in pedestrian crowd dynamics*. SIAM Journal on Control and Optimization, 56.1 (2018): 434-455

### Working papers

Aurell, A. & Rehbinder Karreskog, G. *Stochastic stability of a recency weighted sampling dynamic*. arXiv:2009.12910

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## Teaching Experiences

### Instructor

*Fundamentals of Statistics (first cycle), Princeton University Spring 2021*

### Assistant Instructor

*Optimization, Basic Course (second cycle), KTH Fall 2019, Spring 2019, Fall 2016, Fall 2015, Fall 2014*

*Systems Engineering (second cycle), KTH Fall 2019, Fall 2017*

*Financial Derivatives (second cycle), KTH Fall 2019, Fall 2018, Fall 2017*

*Applied Statistics (first cycle), KTH Fall 2016*

*Probability Theory and Statistics, Basic Course (first cycle), KTH Spring 2016, Fall 2014*

*Markov Processes (first cycle), KTH Spring 2015*

*Multivariate Calculus (first cycle), KTH Spring 2012, Spring 2014*

*Linear Algebra (first cycle), KTH Spring 2012, Spring 2014*

*Single-Variable Calculus (first cycle), KTH Fall 2011, Fall 2012, Fall 2013*

### E-Learning and Educational Tools

*KTH Finance Lab Manager of a digital lab environment with stock market data access and built-in quantitative analytics software. Jan 2015 – Dec 2019, part-time*

*Academedialia Online student mentoring and e-learning content developer (high-school level). Jun 2012 – Aug 2013, part-time*

### Other

*Substitute Instructor, KTH Financial Derivatives (second cycle) Fall 2019, Fall 2018; Probability Theory (second cycle) Fall 2019*

*Substitute Teacher, Fribergaskolan (Stockholm, Sweden) Middle school level. Aug 2008 – Jun 2009*

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## Other

### Awards and Fellowships

*Foundation Blanceflor Boncompagni Ludovisi, née Bildt postdoc stipend 2020, 2021*

*Travel Awards: Styffe foundation 2017, ÅForsk foundation 2018, Knut and Alice Wallenberg foundation 2019*

### Invited Talks and Seminars

*Invited Speaker: Special Session "Stochastic Modeling and Financial Impacts of the Coronavirus Pandemic", SIAM FME 2021. Special Session "Mean Field Games: New Trends and Applications – Part 2", ICIAM 2019. Special Session "Mean Field Games", AIMS 2018.*

*Invited Research Seminar: 2021 IMSI Chicago, MIT Massachusetts Institute of Technology. 2020 KTH Royal Institute of Technology, Karlstad Universitetet. 2019 Linnéuniversitetet. 2018 Stockholms Universitet. 2017 Uppsala Universitet, LinTek.*

### Service

*Technical Reviewer: Reviewed for SIAM Journal on Applied Mathematics/Journal on Financial Mathematics, Automatica, IEEE Transactions on Automatic Control, IEEE Conference on Decision and Control, System & Control Letters, Applied Mathematics and Optimization, Journal of Dynamic Games, Quantitative Finance, The Journal of Computational Finance, MDPI Applied Sciences/Games/Risks/Sensors, Journal of Statistical Mechanics: theory and experiment, Socio-Economic Planning Sciences*

### Non-profit Engagements

*"Svenska med baby" coordinator and session lead in Tensta 2022.*

### Language Proficiency

*Swedish (native), English (full professional proficiency), Polish (limited working proficiency), French (elementary)*