Alexander Aurell – Curriculum Vitae

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alexaurell@gmail.com • alexaurell.github.io

Academic Appointments

Postdoctoral Research Associate — Princeton, NJ, USA
Princeton University, ORFE Department — *Mar 2020 – Jul 2021*
PI: Prof. René Carmona

Education

Ph.D. in Applied and Computational Mathematics — Stockholm, Sweden
KTH Royal Institute of Technology, Department of Mathematics — *Oct 2014 – Dec 2019*
Advisor: Prof. Boualem Djehiche, Co-advisor: Prof. Xiaoming Hu
Thesis title: Topics in the mean-field type approach to pedestrian crowd modeling and conventions

M.Sc. in Engineering Physics — Stockholm, Sweden
KTH Royal Institute of Technology — *Aug 2012 – Sep 2014*
2013: Exchange studies at EPFL, Lausanne, Switzerland
Thesis title: The SVI implied volatility model and its calibration

B.Sc. in Engineering Physics — Stockholm, Sweden
KTH Royal Institute of Technology — *Aug 2009 – Jul 2012*
Thesis title: Sound wave simulation for computer games

Industry Experience

Silo AI — Stockholm, Sweden
Senior AI Scientist — *Sep 2022 – ongoing*
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*

AI Scientist — *Nov 2021 – Sep 2022*
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*

ORC Group — Stockholm, Sweden
Quantitative Analyst Intern (M.Sc. Thesis Project) — *Jan 2014 – Sep 2014*
Developed and implemented a pricing model for stock options with the R&D team.

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., Dayanıklı, 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., Dayanıklı, 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

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*
Academedia *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*

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 Risks/Games/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*)