

Curriculum Vitae – Adam Andersson

Born May 3, 1979, Göteborg, Sweden
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Positions

2021 – **Adjunct Associate Professor in Computational Mathematics**, Chalmers University of Technology, Göteborg. Supported by Saab
2020 – **Senior Radar Systems Engineer**, Saab Surveillance, Göteborg.
2019 – 2020 **Chief Scientist**, Smartr, Göteborg, 15 months.
2016 – 2019 **Consultant and Team Leader within Algorithms**, Syntronic, Göteborg.
2015 – 2016 **Postdoc**, Technische Universität Berlin, 15 months.
2009 – 2015 **PhD position**, Chalmers University of Technology, Göteborg.
2008 – 2009 **Teaching Assistant**, Chalmers University of Technology, Göteborg.

Education

2009– 2015 **PhD. – Mathematics**, Chalmers university of technology. Thesis: On weak convergence, Malliavin calculus and Kolmogorov equations in infinite dimensions, Defense: January, 2015. Opponent: Arnaud Debussche. Supervisor: Stig Larsson.
2003 – 2009 **MSc. – Automation and Mechatronics, Engineering Mathematics**, Chalmers university of technology. Thesis: On weak differentiability of backward SDEs and cross hedging of insurance derivatives. Supervisor: Patrik Albin.

Journal articles

1. A. Andersson and F. Lindner, **Malliavin regularity and weak approximation of semilinear SPDE with Lévy noise**, *Discrete Continuous Dyn. Syst. Ser. B.* (2019), 4271–4294.
2. A. Andersson, M. Hefter, A. Jentzen and R. Kurniawan, **Regularity properties for solutions of infinite dimensional Kolmogorov equations in Hilbert spaces**, *Potential Anal.* (2019), 347–379.
3. A. Andersson, A. Jentzen, R. Kurniawan and T. Welti, **On the differentiability of solutions of stochastic evolution equations with respect to their initial values**, *Nonlinear Anal.* (2017), p. 128–161.
4. A. Andersson and R. Kruse, **Mean-square convergence of the BDF2-Maruyama and backward Euler schemes for SDE with globally monotone coefficients**, *BIT Numer. Math.* (2017), 21–53.
5. A. Andersson, M. Kovács and S. Larsson, **Weak error analysis for semilinear stochastic Volterra equations with additive noise**, *J. Math. Anal. Appl.* (2016), 1283–1304.
6. A. Andersson, R. Kruse and S. Larsson, **Duality in refined Sobolev-Malliavin spaces and weak approximation of SPDE**, *J. SPDE Anal. Comp.* (2016), 113–149.
7. A. Andersson and S. Larsson, **Weak convergence for a spatial approximation of the nonlinear stochastic heat equation**, *Math. Comp.* (2016), p. 1335–1358.

Accepted articles

8. A. Andersson, A. Jentzen and R. Kurniawan, **Existence uniqueness and regularity for stochastic evolution equations with irregular initial values**, *J. Math. Anal. and Appl.*, 35 pages,

Submitted articles

9. A. Andersson, A. Lang, A. Pettersson and L. Schroer, **Finite element approximation of Lyapunov equations for the computation of quadratic functionals of SPDEs**, arXiv:1910.05261 (2019), 41 pages.
10. A. Andersson and F. Lindner, **Poisson Malliavin calculus in Hilbert space with an application to SPDE**, arXiv:1703.07259 (2017), 48 pages.

Supervisor of PhD student:

- 2020– **Kasper Bågmark**: Deep learning for the nonlinear filtering problem. Co-supervised with Annika Lang, Stig Larsson and Lennart Svensson.

Mentor of PhD student:

- 2019 – **Kristoffer Andersson** Deep learning for stochastic control of Vlasov type SDE. Centrum Wiskunde & Informatica, Amsterdam, TU-Delft. Kristoffer is my former master student.

Industrial supervisor of master thesis projects:

- 2021 **Axel Nathanson**: Adaptive radar sensor scheduling with deep reinforcement learning, Chalmers/Saab. Ongoing.
- 2020 **Oskar Holmstedt** and **Elias Hölen Hannouch**: Deep learning accelerated Bayesian estimation for state space models, Chalmers/Smarrtr.
- 2020 **Klara Granbom** On nonlinear machine learning methods for dose-response data in drug discovery, Chalmers/Smarrtr/IRLAB.
- 2020 **Anton Matsson** and **Victor Ohlsson**: Learning customer behavior with generative adversarial imitation learning, Chalmers/Smarrtr.
- 2018 **Kristoffer Andersson**: Approximate stochastic control based on deep learning and forward backward stochastic differential equations, Chalmers/Syntronic.
- 2018 **Gustaf Ehn** and **Hugo Werner**: Scalable reinforcement learning for a simulated production line, Lund University/Syntronic.
- 2017 **Robin Andersson**: Sparse representation and image classification with the shearlet transform, Chalmers/Syntronic.
- 2017 **David Lidberg** and **Viktor Blomqvist**: Swedish dialect classification using artificial neural networks and Gaussian mixture models, Chalmers/Syntronic.

Academic supervisor of master thesis projects:

- 2016 **Leander Schroer**: Numerical approximation of operator Riccati equations for distributed control of SPDE, TU-Berlin.

Assistant supervisor of master thesis projects:

- 2014 **Yueleng Wang**, Efficient computation of the strong and weak error for linear SDE. Chalmers.
2013 **Anna Persson**, A finite element approach to the option pricing model of Hobson and Rogers. Chalmers.

Invited conference talks

- 2020 **Removing computational bottlenecks with deep learning**, Gothenburg Artificial Intelligence Alliance, Göteborg. <https://www.youtube.com/watch?v=1jhtfirtuNq> (starts after 6h 35min).
2019 **Scalable statistical and technical computations with deep learning**, Statistikerträffen, Göteborg.
2018 **A deep BSDE method for stochastic optimal control in engineering**, Stochastic Processes and Their Applications, Göteborg.
2015 **Poisson Malliavin calculus for SPDE**, 4th Annual ERC Berlin-Oxford young researchers meeting on applied stochastic analysis, Weierstrass Institute, Berlin.
2015 **Different approaches to weak convergence analysis for SPDE**, Advances in Numerical Methods for SPDEs, Institut Mittag-Leffler, Stockholm.

Contributed conference talks

- 2014 **Weak convergence analysis for stochastic Volterra equations**, Random Dynamics and Stochastic Numerics, Mannheim. Poster and advert talk.
2013 **A new approach to weak convergence of SPDEs**, Workshop on random dynamical systems, Bielefeld.
2012 **Weak convergence analysis of numerical schemes of stochastic PDEs**, The Swedish mathematical society easter meeting, Luleå.
2012 **Weak convergence of a fully discrete scheme for the nonlinear stochastic heat equation**, Stochastic Analysis and its Applications, Växjö, Sweden.
2012 **Weak error of finite element approximations of a nonlinear stochastic heat equation**, EPSRC Symposium Workshop - Stoch. Anal. and Stoch. PDEs, Warwick.

Conferences (attendance only)

- 2020 **WASP Winter Conference 2020**, Linköping.
2019 **Gothenburg Artificial Intelligence Alliance**, Göteborg.
2019 **WASP Winter Conference 2019**, Göteborg.
2018 **Swedish Symposium on Deep Learning**, Göteborg.
2018 **Gothenburg Artificial Intelligence Alliance**, Göteborg.
2017 **Foundations of computational mathematics**, Barcelona.
2016 **The digital future**, Zuse Institute Berlin.
2013 **Numerical Analysis of Stochastic PDEs**, Henri Lebesgue centre, Rennes.
2013 **Summer School on KPZ eq. and Rough Paths**, Henri Lebesgue centre, Rennes.
2012 **Numerical Solutions of Stochastic PDEs**, University of Warwick.
2011 **Stochastic Partial Differential Equations: Analysis, Numerics, Geometry and Modeling**, ETH, Zürich.
2010 **Stochastic Partial Differential Equations: Approximation, Asymptotics and Computation**, Isaac Newton Institute for mathematical sciences, Cambridge.

Invited lectures

- 2018 **Deep learning for numerical PDE and approximate stochastic control**, CAM, Chalmers, Göteborg.
- 2016 **Kolmogorov equations in infinite dimensions**, Stochastics seminar, Oxford.
- 2015 **Mean-square convergence of the BDF2-Maruyama and backward Euler schemes for SDE with globally monotone coefficients**, CAM, Chalmers, Göteborg.
- 2015 **Operator Riccati equations related to the boundary control of SPDE**, CAM, Chalmers, Göteborg.
- 2015 **On the Markov semigroup related to stochastic evolution equation in Hilbert space**, The Mathematics Colloquium, Linnaeus University, Växjö.
- 2014 **Weak convergence for SPDE: Three approaches**, Computational stochastics seminar, Kaiserslautern.
- 2013 **A new approach to weak convergence of SPDE**, Numerics Colloquium, Bielefeld.
- 2012 **Malliavin calculus for SPDEs and weak convergence analysis for numerical schemes**, Seminar for applied mathematics, ETH, Zürich.
- 2009 **Weak Differentiability of BSDEs**, Mathematical finance seminar, KTH, Stockholm
- 2008 **Weak Differentiability of BSDEs**, PhD student seminar, Humboldt Universität zu Berlin.

Docent lecture

- 2020 **Riccati and Lyapunov equations for control and weak approximation of stochastic PDE**, Chalmers, Göteborg. <https://www.youtube.com/watch?v=VoePEMaH1X0&fbclid=IwAR31d7TRfh22S33A9Q331Z6dn3aEjDLL9tr3VTUff4bdLM2bqNXnrxvL88s>

MeetUp lecture

- 2018 **Deep learning for equation solving and technical computations**, Gothenburg Artificial Intelligence Alliance, Göteborg. <https://www.youtube.com/watch?v=B9ugHg9Sy6g>

Research visits

- 2014 Guest of Raphael Kruse, **TU-Berlin**, 2 weeks.
- 2014 Guest of Felix Lindner, **TU-Kaiserslautern**, 1 week.
- 2013 Guest of Wolf-Jürgen Beyn, **Bielefeld University**, 1 week.
- 2013 Guest of Boualem Djehiche, **Royal Institute of Technology**, Stockholm, 1 week.
- 2012 Guest of Boualem Djehiche, **Royal Institute of Technology**, Stockholm, 1 week.
- 2012 Guest of Arnulf Jentzen, **ETH Zürich**, 1+1 weeks.

Referee for Scientific journals and proceedings

Communications in mathematical sciences (1), Mathematics of computations (2), Potential analysis (1)
SIAM Journal of uncertainty quantification (2), SIAM Journal on Numerical Analysis (1),
Discrete and continuous dynamical systems - A (1), Discrete and continuous dynamical systems - B (1),
Journal of complexity (1), Journal of evolution equations (1), BIT Numerical Mathematics (1),
Advances in difference equations (1), International journal of computer mathematics (1),
Journal of applied mathematics (1), Abstract and applied mathematics (1),
Mathematical and Scientific Machine Learning (1), International Journal of Remote Sensing (1),
Journal of Computational and Applied Mathematics (1)

Funding

2019	Funding from WASP for one PhD student in the Mathematics for AI program.
2013	4 000 SEK from Knut och Alice Wallenbergs resefond for traveling to a conference.
2013	5 000 SEK from SVEFUM for traveling to a conference.
2012	5 000 SEK from SVEFUM for traveling to a conference.
2011	88 000 SEK from University of Gothenburg, temaområde Physical Sciences, to cover the costs of the PhD course <i>stochastic control</i> given at Chalmers in the spring 2012 by Professor Boualem Djehiche from KTH.

Other duties

2020 –	Member of the reference group (referensgruppen) at Mathematical Sciences at Gothenburg University (GU). The group helps the department with an industry perspective on the undergraduate program in mathematics at GU.
2018 –	Reviewer of mainly machine learning publications for Mathematical Reviews .
2015	Discussion leader at licentiate defense of Christoffer Standar, On streamline diffusion schemes for the one and one-half dimensional relativistic Vlasov-Maxwell system , Chalmers.
2011 – 2014	Responsible for the PhD student seminar in mathematics at Chalmers.
2011 – 2014	Organizer of a number of appreciated study groups at Chalmers.
2013	Member of the recruitment committee for the open PhD positions in mathematics, Chalmers.
2012	Member of the recruitment committee for the Advanced Engineering Mathematics program, Chalmers and Fraunhofer Chalmers Center.