

Curriculum Vitae for David Bolin, May 2018

PERSONAL INFORMATION	<i>Name:</i> David Bolin <i>Address (work):</i> Mathematical Sciences, Chalmers University of Technology, SE-41296 Gothenburg, Sweden	<i>Birthdate:</i> July 12, 1983 <i>Nationality:</i> Swedish <i>Phone:</i> +4670-2324231 <i>E-mail:</i> davidbolin@gmail.com
RESEARCH INTERESTS	Spatial statistics, Gaussian Markov random fields, stochastic partial differential equations, spatio-temporal modeling, non-Gaussian processes, analysis of large data sets	
DEGREES AND EDUCATION	Docent in Mathematical statistics <i>University of Gothenburg, Gothenburg, Sweden</i>	October 2017
	Ph.D. in Mathematical statistics <i>Lund University, Lund, Sweden</i> Advisors: Prof. Krzysztof Podgorski and Dr. Finn Lindgren.	June 2012
	Ph.Lic. in Mathematical statistics <i>Lund University, Lund, Sweden</i> Advisors: Prof. Krzysztof Podgorski and Dr. Finn Lindgren.	December 2009
	M.Sc. in Engineering Mathematics <i>Lund University, Lund, Sweden</i> Exchange studies at University of California, Berkeley, August, 2005 - May, 2006	June 2007
	Natural science program (Swedish high school) <i>Sundsvalls Gymnasium, Sundsvall, Sweden</i>	June, 2002
ACADEMIC AND PROFESSIONAL EXPERIENCE	University of Gothenburg , Mathematical Sciences, Gothenburg, Sweden <i>Associate Professor</i>	May, 2016 - Present
	Chalmers University of Technology , Mathematical Sciences, Gothenburg, Sweden <i>Assistant Professor</i>	January, 2014 - April 2016
	Umeå University , Department of Mathematics and Mathematical Statistics, Umeå, Sweden <i>Postdoctoral Fellow</i>	December, 2012 - December, 2013
	Lund University , Mathematical Statistics, Centre for Mathematical Sciences, Lund, Sweden <i>Ph.D. student</i>	January, 2008 - November, 2012
	Lund University , Mathematical Statistics, Centre for Mathematical Sciences, Lund, Sweden <i>Project Assistant</i>	August, 2007 - December, 2007
	California Institute of Technology , Los Angeles, California USA <i>Summer Undergraduate Research Fellow</i>	June, 2006 - August, 2006
	Metso Paper Sundsvall , Computational Fluid Dynamics Group, Sundsvall, Sweden <i>Summer Researcher</i>	June, 2005 - August, 2005
	Lund University , Mathematics LTH, Centre for Mathematical Sciences, Lund, Sweden <i>Teaching Assistant</i>	August, 2003 - May, 2005
	Akzo Nobel , Sundsvall, Sweden <i>Summer Intern as Process Engineer</i>	June - August, 2003 and 2004

GRANTS AND AWARDS

- Co-PI of the 1.3 million SEK project research grant, “Big data based autonomous navigation system for safe and efficient shipping” funded by Area of Advance Transport Chalmers.
- Co-PI of the 680 thousand SEK project research grant, “Application and dissemination of Spatio-Temporal MetOcean models for marine energy applications” funded by BIG DATA @ ICT Chalmers.
- PI of the 2.8 million SEK project research grant, “Latent jump fields for spatial statistics”, Vetenskapsrådet (Swedish research council) grant number 2016-04187.
- Winner of the best paper award at the conference Spatial Statistics: Emerging Patterns, in Avignon, France, 2015.
- Co-PI of the 5.5 million SEK project research grant, “Statistical modelling and intelligent data sampling in MRI and PET measurements for cancer therapy assessment”, Vetenskapsrådet (Swedish research council) grant number 2013-5342. PI Jun Yu.
- Winner of Cramérpriset 2013. The price is awarded by Cramérsällskapet each year to one new Ph.D. in statistics or mathematical statistics at a Swedish university.

SUPERVISION

Ph. D. Students

- Helga Kristín Ólafsdóttir, September 2017 - Present.
- Anders Hildeman, August 2014 - Present.
- Sandra Barman (assistant advisor), July 2014 - Present.

Bachelor students

- Six students at Chalmers, 2017.

EXAMINATION AND EVALUATION

- Frequent reviewer for international journals, such as Journal of the Royal Statistical Society Series B, Journal of the American Statistical Association, Bernoulli, and Annals of Applied Statistics.
- Opponent for licentiate thesis: 1 thesis, 2017, Mathematical statistics, Lund University.
- Examiner for master’s theses: 2 theses, 2016 and 2017, Mathematical sciences, Chalmers.
- Review group member for a 50% seminar, Radiation sciences, Umeå University, January 2013.
- Reviewer for application to the Icelandic Research Fund (IRF), 2017.

EDITORIAL AND ORGANIZATIONAL WORK

- Associate Editor for the Scandinavian Journal of Statistics, October 2017 - present.
- Board member of the Cramérs section of the Swedish Statistical Society, March 2018 - present.
- Organizer of the Smögen workshop on spatial statistics, 2018.
- Organizer of the statistics and biomathematics seminar series at Chalmers, two semesters 2017.
- Organizer of the statistics seminar series at Chalmers, Three semesters, 2015 - 2016.
- Organizer of invited session on spatial statistics at the 26th Nordic conference in Mathematical statistics, Copenhagen, Denmark, 2016.
- Main organizer of the Smögen workshop on spatial statistics, 2016.

PEER-REVIEWED PUBLICATIONS

- P. Sidén, F. Lindgren, **D. Bolin**, M. Villani, Efficient Covariance Approximations for Large Sparse Precision Matrices, Journal of Computational and Graphical Statistics (in press)
- A. Hildeman, **D. Bolin**, J. Wallin, J. Illian, Level set Cox processes. Spatial statistics (in press).
- J. Wallin and **D. Bolin**, Efficient adaptive MCMC through precision estimation, Journal of Computational and Graphical Statistics (in press)
- Y. Yue, **D. Bolin**, H. Rue, and X. Wang, Bayesian Generalized Two-way ANOVA Modeling for Functional Data Using INLA, Statistica Sinica, in press
- **D. Bolin** and F. Lindgren, Calculating probabilistic excursion sets and related quantities using excursions, Journal of Statistical Software, in press
- S. Barman and **D. Bolin** A three-dimensional statistical model for imaged microstructures of porous polymer films, Journal of Microscopy, 269: 247-258 (2018).
- P. Sidén, A. Eklund, **D. Bolin**, M. Villani, Fast Bayesian whole-brain fMRI analysis with spatial 3D priors, NeuroImage, 146, 211-225 (2017)

- **D. Bolin** and F. Lindgren, Quantifying the uncertainty of contour maps, *Journal of Computational and Graphical Statistics*, 26:3, 513-524 (2017)
- C. Gustafson, **D. Bolin**, F. Tufvesson, Modeling the Polarimetric mm-wave Propagation Channel using Censored Measurements, *IEEE GLOBECOM*, Washington (2016)
- **D. Bolin**, A. Frigessi, P. Guttorp, O. Haug, E. Orskaug, I. Scheel, and J. Wallin, Calibrating regionally downscaled precipitation over Norway through quantile-based approaches, *Adv. Stat. Clim. Meteorol. Oceanogr.*, 2, 39-47, (2016)
- **D. Bolin** and J. Wallin, Spatially adaptive covariance tapering, *Spatial Statistics*, 18, 163-178 (2016)
- C. Gustafson, T. Abbas, **D. Bolin**, F. Tufvesson, Statistical Modeling and Estimation of Censored Pathloss Data, *IEEE Wireless Communications Letters*, 4, 569-572 (2015)
- J. Wallin and **D. Bolin**, Geostatistical Modelling Using Non-Gaussian Matérn Fields, *Scandinavian Journal of Statistics*, 42, 872-890, (2015)
- **D. Bolin**, P. Guttorp, A. Januzzi, D. Jones, M. Novak, H. Podschwit, L. Richardson, A. Särkkä, C. Sowder, and A. Zimmerman, Statistical prediction of global sea level from global temperature, *Statistica Sinica*, 25, 351-367 (2015)
- **D. Bolin** and F. Lindgren, Excursion and contour uncertainty regions for latent Gaussian models, *Journal of the Royal Statistical Society, Series B Methodology*, 77, 1, 85-106, (2015)
- C. Gustafson, **D. Bolin**, and F. Tufvesson, Modeling the cluster decay in mm-Wave channels, proceedings of the 8th European Conference on Antennas and Propagation, Hague (2014)
- P. Guttorp, **D. Bolin**, A. Januzzi, D. Jones, M. Novak, H. Podschwit, L. Richardson, A. Särkkä, C. Sowder, and A. Zimmerman, Assessing the uncertainty in projecting local mean sea level from global temperature, *Journal of Applied Meteorology and Climatology*, 53, 2163-2170 (2014)
- **D. Bolin**, Spatial Matérn fields driven by non-Gaussian noise, *Scandinavian Journal of Statistics*, 41, 557-579, (2014)
- **D. Bolin** and F. Lindgren, A comparison between Markov approximations and other methods for large spatial data sets, *Computational Statistics and Data Analysis*, 61, 7-21 (2013)
- **D. Bolin** and F. Lindgren, Spatial models generated by nested stochastic partial differential equations, with an application to global ozone mapping, *Annals of Applied Statistics*, Vol. 5, No. 1, 523-550 (2011)
- G. Lindgren, **D. Bolin**, and F. Lindgren, Non-traditional stochastic models for ocean waves, Lagrange models and nested SPDE models, *Eur. Phys. J. Special Topics* 185, 209-224 (2010)
- **D. Bolin**, J. Lindström, L. Eklundh, and F. Lindgren, Fast Estimation of Spatially Dependent Temporal Vegetation Trends using Gaussian Markov Random Fields, *Computational Statistics and Data Analysis* 53, 2885-2896 (2009)

POPULAR SCIENCE
AND OTHER
PUBLICATIONS

- **D. Bolin**, Spatial statistik och beräkningsintensiva metoder, *Qvintensen* Nr. 3, 2013.
- **D. Bolin**, Discussion of "An explicit link between Gaussian fields and Gaussian Markov random fields: The stochastic partial differential equation approach" by Finn Lindgren, Håvard Rue and Johan Lindström. *Journal of the Royal Statistical Society, Series B*, 73, 467-468 (2011).

THESES

- **D. Bolin**, Models and Methods for Random Fields in Spatial Statistics with Computational Efficiency from Markov Properties, *Doctoral Theses in Mathematical Sciences 2012:2*, Lund University (2012)
- **D. Bolin**, Computationally efficient methods in spatial statistics, applications in environmental modeling, *Licentiate Theses in Mathematical Sciences 2009:4*, Lund University (2009)
- **D. Bolin**, Estimating Vegetation Trends in the African Sahel using Gaussian Markov Random Fields, *Master's thesis*, Lund University, Lund, LUTFMS-3090-2007 (2007)

PREPRINTS AND
TECHNICAL REPORTS

- Ö. Asar, **D. Bolin**, P. J. Diggle, J. Wallin Linear Mixed-Effects Models for Non-Gaussian Repeated Measurement Data, *ArXiv preprint* (2018).
- H. Bakka, H. Rue, G.-A. Fuglstad, A. Riebler, **D. Bolin**, E. Krainski, D. Simpson, and F. Lindgren, Spatial modelling with R-INLA: A review, *ArXiv preprint* (2018).

- **D. Bolin** and J. Wallin, Multivariate Type-G Matérn fields, ArXiv preprint (2018).
- **D. Bolin**, K. Kirchner, The rational SPDE approach for Gaussian fields with general smoothness, ArXiv preprint (2018).
- **D. Bolin**, K. Kirchner, M. Kovács, Weak convergence of Galerkin approximations for fractional elliptic stochastic PDEs with spatial white noise ArXiv preprint (2017).
- **D. Bolin**, K. Kirchner, The SPDE approach for Gaussian random fields with general smoothness ArXiv preprint (2017).
- A. Mejia, Y.R. Yue, **D. Bolin**, F. Lindren, M.A. Lindquist, A Bayesian General Linear Modeling Approach to Cortical Surface fMRI Data Analysis ArXiv preprint (2017).
- **D. Bolin**, K. Kirchner, M. Kovács, Numerical solution of fractional elliptic stochastic PDEs with spatial white noise ArXiv preprint (2017).
- A. Hildeman, **D. Bolin**, J. Wallin, A. Johansson, T. Nyholm, T. Asklund, J. Yu, Whole-brain substitute CT generation using Markov random field mixture models, ArXiv preprint (2016)
- Y. Yue, M. Lindquist, **D. Bolin**, F. Lindgren, D. Simpson, and H. Rue, A Bayesian General Linear Modeling Approach to fMRI Data Analysis (2014)
- **D. Bolin**, J. Wallin, and F. Lindgren, Multivariate latent Gaussian random field mixture models (2014)
- B.N. Hellquist, **D. Bolin**, J. Yu, and H. Jonsson, Poisson based model for adjusting for non-compliance and contamination in cohort studies, *part of the Ph.D. thesis by B.N. Hellquist* (2014)

INVITED TALKS

- ESCO 2018, 6th European Seminar on Computing Pilsen, Czech Republic, June, 2018.
- ISCCRO'18 conference, Opatija, Croatia, May, 2018.
- Statistics seminar, EPFL, Lausanne, Switzerland, April, 2018
- Workshop, Can Stochastic Geometry handle Dynamics of Risk Management? Lund, Sweden, April 2018
- TIES-GRASPA 2017 conferece, Bergamo, Italy, July 2017
- BIRS Workshop, Challenges in the Statistical Modeling of Stochastic Processes for the Natural Sciences, Banff, Canada, July 2017
- Statistics seminar, Department of Statistics, Uppsala University, Uppsala, Sweden, December 2016.
- Statistics seminar, division of mathematical statistics, Stockholm University, Stockholm, Sweden, November 2016.
- Workshop on latent Gaussian models, NTNU, Trondheim, Norway, November 2016
- Workshop on Statistics for High-Dimensional and Complex Data, KAUST, Saudi Arabia, November 2016
- NASPDE 2016 (Numerical Analysis of Stochastic Partial Differential Equations), Gothenburg, September 2016
- 26th Nordic conference in Mathematical statistics, Copenhagen, Denmark, June 2016.
- ISBA 2016 World Meeting, Sardinia, Italy, June 2016.
- International workshop on spatio-temporal statistics, Imperial collage, UK, April 2016.
- 27th Nordic Congress of Mathematicians, Stockholm, Sweden, March 2016.
- Statistics and mathematical statistics seminar, Linköping University, February 2016.
- TIES 2016, Al Ail, United Arab Emirates, 2015.
- CREEM seminar, university of St Andrews, UK, August 2015.
- Invited poster, Joint Statistical Meetings, Seattle, USA, August 2015.
- European Meeting of Statisticians, Amsterdam, Netherlands, July 2015.
- Smögen workshop, Smögen, Sweden, August 2014.
- Joint Statistical Meetings, Montréal, Canada, August 2013.
- Cramérskapet annual meeting, Uppsala, Sweden, March 2013.
- Statistics seminar, NTNU, Trondheim, Norway April 2013.
- Matematisk kväll, a popular science lecture series at Umeå university, Umeå, April 2013.
- Statistics seminar, department of mathematical sciences, Chalmers University of Technology, Gothenburg, Sweden, November 2012.
- Statistics seminar, department mathematics and mathematical statistics, Umeå University, Umeå,

Sweden, October 2012.

- Statistics seminar, division of mathematical statistics, Stockholm University, Stockholm, Sweden, May 2012.
- Cramérsällskapet annual meeting, Alnarp, Sweden, March 2012.
- Bi-annual meeting of Trondheim Statistics Association, Trondheim, Norway, November 2010.
- Symposium on Random Processes and Fields: Theory and Applications, Lund, Sweden, November 2010.
- Smögen workshop, Smögen, Sweden, August 2010.
- 23rd Nordic Conference on Mathematical Statistics, Voss, Norway, June 2010.
- IMAGE GSP Seminar, NCAR, Boulder, USA, April 2010.
- 20th Annual Conference of The International Environmetrics Society, Bologna, Italy, July 2009.

OTHER SELECTED PRESENTATIONS

- Discussion leader of breakout session on Visualization at the BIRS Workshop, Challenges in the Statistical Modeling of Stochastic Processes for the Natural Sciences, Banff, Canada, July 2017
- Contributed talk, Spatial statistics: Emerging Patterns, Avignon, France, June 2015.
- Contributed talk, Third Workshop on Bayesian Inference for Latent Gaussian Models with Applications, Reykjavík, Iceland, September 2013.
- Contributed talk, second Workshop on Bayesian Inference for Latent Gaussian Models with Applications, Trondheim, Norway, May 2012.
- Short presentation at the reading of the paper An explicit link between Gaussian fields and Gaussian Markov random fields; the stochastic partial differential equation approach, Royal Statistical Society, London, March 2011.
- Lecture series covering Vector spherical harmonics, nested SPDEs, non-Gaussian Matérn fields, IMF, NTNU, Trondheim, Norway, November 2010.
- Poster presentation, 41st Winter Conference in Statistics, Storhogna, Sweden, March 2010.
- Poster presentation, Interdisciplinary workshop on Effects of climate change: coastal systems, policy implications, and the role of statistics, Malta, March 2009.
- Presentation, IMAGE GSP Seminar, NCAR, Boulder, USA, September 2008.
- Contributed talk, 19th Annual Conference of The International Environmetrics Society, Kelowna, Canada, June 2008.

TEACHING EXPERIENCE

Lecturing and teaching

- Lecturer and course administrator, TMS016/MSA300, Master course on statistical image analysis, Chalmers university of technology (spring 2018)
- Lecturer and course administrator, TMA074, a basic statistics course for Chemistry engineering students, Chalmers university of technology, 3 semesters (fall 2015, 2016, and 2017)
- Lecturer and course administrator, TMA073, a basic statistics course for Chemistry engineering students, Chalmers university of technology, 2 semesters (spring 2014 and spring 2015)
- Organizer of a PhD reading course on inverse problems, Chalmers university of technology, one semester (spring 2015)
- Lecturer and course administrator, Gaussian Markov random fields, PhD course, Chalmers university of technology, one semester (spring 2015)
- Guest lecturer, Master course Computer intensive statistical methods, Chalmers university of technology, 2 semesters (fall 2014 and fall 2016)
- Guest lecturer, Environmental risk assessment in engineering, Chalmers university of technology, two semesters (spring 2014 and spring 2015)
- Lecturer, Pan-American Advanced Study Institute on Spatio-Temporal Statistics, PhD course, Búzios, Brazil, 2014
- Lecturer, Spatial Statistics for Ecologists, PhD course, Swedish University of Agricultural Sciences, Umeå, one semester (fall 2013)
- Course administrator and lecturer, master course Monte Carlo and Empirical Methods for Statistical Inference, Lund University, one semester (spring 2011)
- Teacher, Mathematical statistics for Biotechnology engineering students, Lund University, one

semester (fall 2011)

Course development

- Developed TMA074, a new basic statistics course for Chemistry engineering students at Chalmers university of technology, 2015
- Developed a new PhD course in Gaussian Markov random fields, Chalmers university of technology, 2015

Exercise, computer lab, and project supervision

- Basic courses in Linear algebra, Lund University, 4 semesters (2003-2005)
- Basic courses in Statistics, Lund University, 2 semesters (2007-2008)
- Basic course in Stochastic processes, Lund University, 2 semesters (2008-2009)
- Time series analysis, Lund University, 2 semesters 2008-2009.
- Statistical modeling of extreme values, Lund University, 1 semester (2008)
- Mathematical Modelling, Advanced course, Lund University, 2009.