

# Reza Mohammadi

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## Research

2017-Now **Assistant Professor in Statistics**, Faculty of Economics and Business, Amsterdam Business School, University of Amsterdam, Netherlands  
Feb 2019 **Research visit** to Prof. Helene Massam; York University, Canada  
April 2018 **Research visit** to Prof. Nial Friel; University College Dublin, Ireland  
2016-2017 **Postdoctoral Fellow in Statistics**, Department of Methodology and Statistics, Tilburg University, Netherlands  
2017 **Visiting Scholar**, Department of Mathematics and Statistics, York University, Canada  
Topic: “Bayesian Model Selection in Color Graphs”  
Fully rewarded by NSERC Siscovery grant of my host  
Invited by: *Prof. Helene Massam* for 4 months  
2011-2015 **Ph.D. in Probability and Statistics**, University of Groningen, Netherlands  
Thesis Title: “Bayesian Model Determination in Complex Systems”  
Advisor: *Prof. Ernst Wit*

## Education

2005-2008 **M.Sc. in Mathematical Statistics**, Allameh Tabatabaei University, Tehran, Iran  
2001-2005 **B.Sc. in Statistics**, Persian Gulf University, Bushehr, Iran

## Research Interests

High Dimensional Modeling; Bayesian Statistics; Statistical Machine Learning; Computational Statistics; Causal Inference Network analysis; Graphical Models;

## Grants

2018 Travel grant for the COSTNET conference, Warsaw University of Life Sciences, September 26-28  
2018 Short Term Scientific Mission grant for 2 weeks visiting at University College Dublin  
2017 Scholar Visit Grant for 4 months at York University  
2017 Travel grant for the COSTNET17 conference, Palma de Mallorca, October 25-27

## Journal Articles

- 2019 **Mohammadi, R.** and Wit, E. (2019) “BDgraph: An R Package for Bayesian Structure Learning in Graphical Models”, *Journal of Statistical Software*, 89(3):1-30.
- 2018 Dobra, A. and **Mohammadi, R.** (2018) “Loglinear model selection and human mobility”, *Annals of Applied Statistics*, 12(2):815-845.
- 2018 **Mohammadi, R.** (2018) “Contributed Discussion on Article by Wade and Ghahramani”, *Bayesian Analysis*, 13(2):608-610
- 2018 Hinne, M., Janssen, R.J., and **Mohammadi, R.** (2018) “Contributed Discussion on Article by Bezener, Hughes, and Jones”, *Bayesian Analysis*, 13(4):1304-1306
- 2018 Dyrba, M., Grothea, M.J., **Mohammadi, A.**, Binderiii, H., Kirsteiv, T., and Teipel, S.J. (2018) “Comparison of different hypotheses regarding the spread of Alzheimer’s disease using Markov random fields and multimodal imaging”, *Journal of Alzheimer Disease*, 65(3), 731-746
- 2017 **Mohammadi, A.**, Abegaz, F., Heuvel, E., and Wit, E. (2017) “Bayesian Modelling of Dupuytren Disease Using Gaussian Copula Graphical Models”, *Journal of Royal Statistical Society-Series C*, 66(3):629–645
- 2017 **Mohammadi, A.** and Dobra, A. (2017) “The R Package BDgraph for Bayesian Structure Learning in Graphical Models”, *ISBA Bulletin*, 24(4):11-16
- 2016 **Mohammadi, A.** and Kaptein, M. (2016) “Efficient Metropolis Hastings Proposal Mechanisms for Bayesian Regression Tree Models”, *Bayesian Analysis*, 11(3):938–940
- 2015 **Mohammadi, A.** and Wit, E. (2015) “Bayesian Structure Learning in Gaussian Graphical Models”, *Bayesian Analysis*, 10(1):109-138
- 2014 **Mohammadi, A.** and Wit, E. (2014) “Contributed Discussion on Article by Finegold and Drton”, *Bayesian Analysis*, 9(3):577-579
- 2013 **Mohammadi, A.**, Salehi-Rad, M.R. and Wit, E. (2013) “Using Mixture of Gamma Distributions for Bayesian Analysis in an M/G/1 Queue with Optional Second Service”, *Computational Statistics*, 28:683-700
- 2012 **Mohammadi, A.** and Salehi-Rad, M.R. (2012) “Bayesian Inference and Prediction in an M/G/1 with Optional Second Service”, *Communications in Statistics-Simulation and Computation*, 41:419-443

## Articles in Progress

- 2019 **Mohammadi, R.**, Pratola, M., and Kaptein, M. (2019) “Continuous-Time Birth-Death MCMC for Bayesian Regression Tree Models”, *arXiv preprint arXiv:1904.09339*
- 2019 Rasero, J., Rivera, D., **Mohammadi, R.**, Wit, E., Cortes, J. M., and Arango-Lasprilla, J. C. (2019) “The usefulness of Bayesian graphical modelling with neuropsychological data”, *PsyArXiv*, doi:10.31234/osf.io/8cr2f
- 2018 Dyrba, M., **Mohammadi, R.**, Grothe, M.J., Kirste, T., and Teipel, S.J. (2018) “Assessing inter-modal and inter-regional dependencies in prodromal Alzheimer’s disease using multimodal MRI/PET and Gaussian graphical models”, *arXiv preprint arXiv:1804.00049*

- 2017 **Mohammadi, R.**, Massam, H., and Letac, G. (2017) “The ratio of normalizing constants for Bayesian graphical Gaussian model selection”, *arXiv preprint arXiv:1706.04416*

## Refereed Conference Articles

- 2018 **Mohammadi, R.** and Dyrba, M. (2018) “Statistical modelling of brain connectivity in prodromal Alzheimer’s disease”, *Proceedings of the 33th International Workshop on Statistical Modeling*, volume 2, 219-222
- 2017 **Mohammadi, A.** and Wit, E. (2017) “Bayesian Modelling of the Exponential Random Graph Models with Non-observed Networks”, *Proceedings of the 32th International Workshop on Statistical Modelin*, volume 2, 211-214
- 2014 **Mohammadi, A.**, Abegaz, F., and Wit, E. (2014) “Bayesian Copula Gaussian Graphical Modeling”, *Proceedings of the 29th International Workshop on Statistical Modeling*, volume 1, 225-230

## Software

- 2019 **Mohammadi, R.** and Wit, E. (2019) “BDgraph: Bayesian Structure Learning in Graphical Models using Birth-Death MCMC”, **R package** version 2.59,  
URL: <http://cran.R-project.org/package=BDgraph>
- 2019 **Mohammadi, R.** (2019) “ssgraph: Bayesian Graphical Estimation using Spike-and-Slab Priors”, **R package** version 1.8,  
URL: <http://cran.R-project.org/package=ssgraph>
- 2019 **Mohammadi, R.** (2019) “bmixture: Bayesian Estimation for Finite Mixture of Distributions”, **R package** version 1.3,  
URL: <https://cran.R-project.org/package=bmixture>

## Books

- 2015 **Mohammadi, A.** (2015) *Bayesian Model Determination in Complex Systems*, My PhD Thesis, University of Groningen, ISBN 978-90-367-7831-2 (in English)
- 2007 **Mohammadi, A.** (2007) *Statistics for College Students (Vol.II: Mathematical Statistics)*, Tehran: Pardazesh Press, ISBN 978-964-2038-49-7 (in Persian)
- 2006 **Mohammadi, A.** (2006) *Statistics for College Students (Vol.I: Application Probability)*, Tehran: Pardazesh Press, ISBN 978-600-5137-98-9 (in Persian)

## Invited Talks

- Dec 2018 “Bayesian Structure Learning of High-dimensional Graphical Models with Application to Brain”, CMStatistics, **Pisa**, Italy
- Nov 2018 “High-dimensional Bayesian inference for Graphical Models with Application to Brain Connectivity”, Bayesian Statistics in the Big Data Era, **Marseille**, France

- Feb 2018 “Learning Brain Connectivity Using Joint Functional and Structural Data”, Fourth BCAM Workshop on Quantitative Biomedicine for Health and Disease, **Bilbao**, Spain
- Aug 2016 “Bayesian Modelling of Dupuytren Disease Using Gaussian Copula Graphical Models”, *Network Science and its Applications*, **Cambridge**, UK
- Aug 2015 “Bayesian Structure Learning in Graphical Models”, *JSM2015*, **Seattle**, USA
- March 2015 “Bayesian Structure Learning in Sparse Graphical Models”, Institute for Computing and Information Sciences, Radboud University Nijmegen, **Nijmegen**, Netherlands
- June 2013 “Bayesian Model Selection in Gaussian Graphical Models”, Bayesian Nonparametrics, **Leiden**, Netherlands

## Contributed Talks

- Sep 2018 “High-dimensional Bayesian inference of Graphical Models with Application to Brain Connectivity”, *COSTNET18 conference*, **Warsaw**, Poland
- July 2015 “Bayesian Structure Learning in Sparse Graphical Models”, *European Meeting of Statisticians*, **Amsterdam**, Netherlands
- July 2014 “Bayesian Gaussian Copula Graphical Modeling”, 29th International Workshop on Statistical Modeling, **Gottingen**, Germany
- Dec 2013 “Bayesian Graph Selection with Applications”, **Groningen**, Netherlands
- Mar 2013 “Gene Network Inference for High-dimensional Problems”, Gene Network Inference Meeting 2013, **Paris**, France
- Mar 2013 “Gaussian Graphical Model Determination based on Birth-death MCMC Inference”, STAR meeting day, **Leiden**, Netherlands
- Jan 2013 “Network Determination based on Birth-death MCMC Inference”, YES Workshop, **Eindhoven**, Netherlands
- Dec 2011 “Using Mixture of Gammas for Bayesian Analysis in an M/G/1 Gueue with Optional Second Service”, 4th International Conference of the ERCIM WG on Computing Statistics, University of London, **London**, UK
- Aug 2009 “On Bayesian Estimation for the M/G/1 Queue with Optional Second Service”, International Conference of Mathematical Sciences, Maltepe University, **Istanbul**, Turkey

## Poster Presentations

- July 2018 “Statistical modelling of brain connectivity in prodromal Alzheimer’s disease”, IWSM 2018, **Bristol**, UK
- June 2018 “Bayesian Structure Learning of High-dimensional Graphical Models with Application to Brain”, 2018 ISBA World Meeting, **Edinburgh**, UK
- Oct 2017 “Bayesian Structure Learning of High-dimensional Graphical Models with Application to Brain Connectivity”, *COSTNET17 conference*, **Palma de Mallorca**, Spain
- July 2017 “Early Detection of Alzheimer with fMRI data using Extension of Exponential Random Graph Models”, IWSM 2017, **Groningen**, Netherlands
- June 2016 “Stochastic Search Algorithm for Bayesian Inference of High-dimensional Graphical

- Models”, 2016 ISBA World Meeting, **Sardinia**, Italy
- Nov 2012 “Efficient Birth-death MCMC Inference for Gaussian Graphical Models”, Programme 40th Stochastics Meeting Lunteren, **Lunteren**, Netherlands
- Nov 2011 “Using Mixture of Gammas for Bayesian Analysis in an M/G/1 Queue with Optional Second Service”, 40th Stochastics Meeting Lunteren, **Lunteren**, Netherlands

## Academic Activities

- Fall 2018 **Supervised an master student**, University of Amsterdam, Netherlands
- Fall 2009 **Supervised three undergraduate students**, Adiban Higher Education Institute, Garmsar, Iran

## Referee for Journals

Journal of the American Statistical Association (JASA); Bayesian Analysis; PLOS ONE;

## Teaching Experience

- Winter 2019 “Management Research Method I”, Department of Operation Management, University of Amsterdam, Netherlands
- Fall 2018 “Data Wrangling”, “Management Research Method I”, Department of Operation Management, University of Amsterdam, Netherlands
- Winter 2018 “Management Research Method I”, Department of Operation Management, University of Amsterdam, Netherlands
- Fall 2016 “Mathematics for International Programs”, Department of Methodology and Statistics, Tilburg University, Netherlands
- Fall 2011 “Statistical Computing”, “Sampling Theory II”, Alborz Higher Education Institute, Ghazvin, Iran
- Spring 2010 “Statistical Computing”, “Continuous Multivariate Statistical Methods”, “Technical English Language”, Alborz Higher Education Institute, Ghazvin, Iran
- Fall 2010 “Continuous Multivariate Statistical Methods”, “Stochastic process I”, “Statistical Quality Control”, Alborz Higher Education Institute, Ghazvin, Iran
- Spring 2009 “Continuous Multivariate Statistical Methods”, “Sampling Theory I”, “Application Probability”, “Statistics and Probability”, Alborz Higher Education Institute, Ghazvin, Iran
- Fall 2009 “Advanced Statistical Models”, “Statistical Decision”, “Sampling Theory II”, “Mathematical Statistics I”, Adiban Higher Education Institute, Garmsar, Iran
- Spring 2008 “Mathematics for Humanities”, Department of Social Sciences, Faculty of Humanism, Allameh Tabatabaei University, Tehran, Iran

## Teaching Assistant

- Winter 2019 “Business Operations Processes”, Department of Operation Management, University of Amsterdam, Netherlands
- Fall 2016 “Causal Analysis Techniques”, Department of Methodology and Statistics, Tilburg University, Netherlands
- 2012-2014 “Statistical Reasoning”, “Bayesian Statistics”, “Statistical Modelling”, “Mathematical Statistics I”, Johann Bernoulli Institute, University of Groningen, Netherlands
- 2005-2008 “Mathematical Statistics I” and “Mathematical Statistics I” courses during my M.Sc. program
- 2002-2005 “Mathematical Statistics I”, “Mathematical Statistics II”, “Probability I” and “Probability II” courses during my B.Sc. program

## Software Skills

- Advance** *C/C++* (I have implemented the main part of the BDgraph, ssgraph, and bmixture packages in *C++*)
- Advance** *R* (I had taught R in the “Data Wrangling” course in Spring 2018)
- Basic** *Matlab*
- Advance** *L<sup>A</sup>T<sub>E</sub>X*, *MS-Office*, *Linux*, *MS-Windows*

## Other Activities

- 2018-Now Main organizer of seminars for the Department of Operation Management, University of Amsterdam, Netherlands
- 2018 Chair an Invited Member Session: Bayesian Methodology for Modeling Human Movement at “2018 ISBA World Meeting”, Edinburgh, UK
- 2017 Local Organization Committee of “International Workshop on Statistical Modelling 2017”, Groningen, Netherlands
- 2013-2014 Board member of Gopher (Groningen Organization for PhD Education and Research), Groningen, Netherlands
- 2002-2005 Board member of Student Association at the Persian Gulf University, Bushehr, Iran

## References

- *Ronald Does*  
Full Professor of Industrial Statistics,  
Head of Department of Operations Management, University of Amsterdam,  
Netherlands  
Email: [R.J.M.M.Does@uva.nl](mailto:R.J.M.M.Does@uva.nl)
- *Ernst C. Wit*  
Full Professor of Statistics and Data Science,  
Institute of Computational Science, Universita della Svizzera Italiana, Lugano,

Switzerland

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- *Helene Massam*  
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Department of Mathematics and Statistics, York University, Toronto, Canada  
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- *Edwin van den Heuvel*  
Full Professor of Statistics,  
Department of Mathematics and Computer Science, Eindhoven University of  
Technology, Netherlands  
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