

MAJA RITA RUDOLPH

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<https://github.com/mariru/>

EDUCATION

Columbia University PhD student in Computer Science Concentration: Machine Learning	2015 - Present New York, NY
Columbia University M.S. in Electrical Engineering	2013 - 2015 New York, NY
Massachusetts Institute of Technology (MIT) B.S. in Mathematics, GPA: 4.7/5.0	2010 - 2013 Cambridge, MA
Delaware State University Mathematics, GPA: 4.0/4.0 Full Athletic Scholarship, transferred to MIT	2009 - 2010 Dover, DE

RESEARCH EXPERIENCE

Columbia University, Department of Computer Science Graduate Research Assistant Advisor: Prof. David Blei	2015 - Present New York, NY
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- My research is focused on embeddings – methods for learning interpretable representations from data. The embedding models we develop lie at the intersection of Bayesian machine learning and deep learning. Bayesian modeling helps communicate modeling choices and to reason about uncertainty while neural networks provide the flexibility to model complex interactions in the data.
- I contribute to Edward, a python library for probabilistic modeling, inference, and model criticism.

PUBLICATIONS

- **M. Rudolph** and D. Blei. "Dynamic Embeddings for Language Evolution", In *WWW*, 2018
- **M. Rudolph**, F. Ruiz, and D. Blei. "Word2Net: Deep Representations of Language", In *Bayesian Deep Learning Workshop, NIPS*, 2017
- **M. Rudolph**, F. Ruiz, and D. Blei. "Structured Embedding Models for Grouped Data", In *NIPS*, 2017
- **M. Rudolph**, F. Ruiz, S. Mandt, and D. Blei. "Exponential Family Embeddings", In *NIPS*, 2016
- D. Tran, A. Kucukelbir, A. Dieng, **M. Rudolph**, D. Liang, D. Blei, "Edward: A library for probabilistic modeling, inference, and criticism", *arXiv:1610.09787*
- **M. Rudolph**, J. Ellis, and D. Blei. "Objective Variables for Probabilistic Revenue Maximization in Second-Price Auctions with Reserve", In *WWW*, 2016
- **M. Rudolph**, A. Hertzmann, M. Hoffman. "A Joint Model for Who-to-Follow and What-to-View Recommendations on Behance", In *Workshop on Modeling Social Media, WWW*, 2016
- **M. Rudolph**, D. Blei. "The Dirichlet-Gamma Filter for Discovery of Neural Ensembles and their Temporal Dynamics", In *Workshop on Statistical Analysis of Neural Data, NIPS*, 2015
- **M. Rudolph**, S. Gultekin, J. Paisley, S. Chang. "Probabilistic Canonical Tensor Decomposition for Predicting User Preference", In *Workshop for Personalization: Applications and Methods, NIPS*, 2014

SKILLS

Research Probabilistic Modeling, (Word) Embeddings, Neural Language Models, Deep Learning
Coding Python, Tensorflow, Theano, Unix, C++, Stan, Matlab, OpenCV, Latex, SQL, Javascript
Languages English, German, Hebrew (fluent); Latin (proficient); French, Spanish (intermediate)

INVITED TALKS

- *Edward - Probabilistic Modeling Made Easy*, Pygotham, October 2017, New York, NY
- *Structured Embedding Models*, MIC3 Meaning in Context Workshop, September 2017, Stanford University, Stanford, CA
- *Dynamic Bernoulli Embeddings for Language Evolution*, CSDP workshop on Real World Impacts of Political and Legal Texts, April 2017, Princeton University, Princeton, NJ.
- *Tutorial: Automating Machine Learning with Tensorflow and Edward*, March 2017, Riken Institute, Tokyo, Japan.
- *Exponential Family Embeddings*, March 2017, Riken Institute, Tokyo, Japan.
- *Exponential Family Embeddings*, Machine Learning Reading Group, October 2016, Princeton University, Princeton, NJ.
- *Tutorial: Applied Probabilistic Programming*, Janelia Machine Learning and Computer Vision Workshop, October 2016, Howard Hughes Medical Institute, Ashburn, VA.
- *Exponential Family Embeddings*, Janelia Machine Learning and Computer Vision Workshop, October 2016, Howard Hughes Medical Institute, Ashburn, VA.

WORK EXPERIENCE

Adobe Creative Technologies Lab Summer 2015
Research Intern San Francisco, CA

- Formulated a novel model to capture the viewing behavior and the social network of Behance users
- Derived and implemented an efficient inference algorithm to fit the model to data
- Studied the quality of "who to follow" and "what to view" recommendations of the model

SAP Innovation Center Spring 2013
Software Intern Potsdam, Germany

- Contributed to efforts of leveraging in-memory database technology for life science research
- Evaluated and compared the performance of machine learning algorithms in R and C++
- Implemented an interactive decision tree visualization tool
- Studied and presented various topics in bioinformatics including protein matching and structural search of chemical compounds

PROFESSIONAL SERVICE

Women in Machine Learning Workshop December 2017
Finance and Sponsorship Chair Long Beach, CA

- Organized the 2017 Women in Machine Learning workshop with a team of 5 volunteers
- Led fundraising and successfully raised and managed \$260,000 for program costs and travel grants

Program Committee AISTATS 2017, ICML 2017, NIPS 2017, AISTATS 2018, ICLR 2018

TEACHING EXPERIENCE

Columbia University, Department of Computer Science Fall 2017
Teaching Assistant, *Machine Learning with Probabilistic Programming* New York, NY

- Taught lecture on embedding methods. Covered exponential family embeddings, dynamic embeddings, structured embeddings, and word2net
- Helped faculty with the preparation and grading of homeworks

Columbia University, Department of Computer Science Fall 2015/16
Teaching Assistant, *Foundations of Graphical Models* New York, NY

- Advised students on machine learning projects during weekly office hours
- Helped faculty with the preparation and grading of homeworks

MIT, Department of Electrical Engineering and Computer Science Fall 2011
Lab Assistant, *Mathematics for Computer Science Course* Cambridge, MA

- Led and supported groups of 6-8 students during in-class problem solving sessions
- Helped faculty with the preparation of class materials

Local Primary Schools 2003-2006
Tutor and Mentor Tübingen, Germany

- Volunteered 3 hours per week tutoring socially disadvantaged children
- Supported the students with migration background to overcome language barriers
- Motivated discouraged children to do their homework and take active part in their education

HONORS AND AWARDS

- MISTI 2.0 travel grant for research experience in India 2013
- MISTI India travel grant for research experience in India 2012
- MISTI Israel travel grant for research experience in Israel 2011
- C. Hurd Scholarship for Mathematical Sciences, MIT 2010 - 2012
- Full Athletic Scholarship, Delaware State University 2009 - 2010
- German National Champion in Bridge, Category Schools 2007