Fangjian Guo

Personal Information

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Education

2013 – present **Duke University, Durham, NC, USA**.
2nd-year PhD student in machine learning, Department of Computer Science
Advisor: Katherine A. Heller Committee Members: David B. Dunson, Ronald Parr
GPA: **3.97**/4.00

2009 – 2013 **University of Electronic Science and Technology of China, Chengdu, P.R.China**.
B.Eng. in computer science and technology, graduated with **highest distinction**
Advisor: Tao Zhou Thesis: *A Statistical Analysis of Diverging Moments*.
GPA: **3.89**/4.00 Ranking: **1**/110

Research Interests

Modeling Bayesian latent variable models, Bayesian nonparameteric models for hierarchical and network structures, Stochastic processes, Graphical models, Natural Language Processing.

Inference Scalable Bayesian inference, MCMC, Belief propagation

Theory Connecting statistical physics and machine learning, especially in graphical models and stochastic processes.

Application Modeling, understanding and predicting human behaviors, especially the interplay among structure, dynamics and contents in social processes, e.g. online/offline communications, social networking, tagging and rating. Discovering and quantifying predictive patterns with machine learning techniques and applying them to recommendation, advertising and information retrieval. Testing and quantifying sociological theories with statistical models and large-scale data.

Research Experience

Nov 2014 – present **An EM-BP Framework for Recommendation Systems**,
advised by Prof. Henry Pfister.
Duke University

Developing efficient and accurate rating prediction algorithms via a combined scheme of expectation-maximization and belief propagation. It significantly reduces the "cold-start" problem by exploiting long-range correlations.

April 2014 – Oct 2014 **Modeling Influence in Conversations**,
advised by Prof. Katherine Heller and Prof. Hanna Wallach.
Duke University

People's language usage tend to drift towards to those influential speakers in a conversation, which is a phenomenon known as "linguistic accommodation". We discover the latent influence network by modeling the evolution of language usage over time. Our model finds interesting patterns underlying political science and movie subtitle data.

Dec 2013 – Jan 2014 **Modeling and Calibrating Ratings across Categories**,
advised by Prof. David Dunson.
Duke University

In online rating systems, users tend to rate items with different internal standards across categories. By modeling such categorical dependence, ratings can be calibrated accordingly to remove the unfair bias and increase the diversity of recommendation systems. We proposed a Bayesian probit model that is able to discover interesting genre-specific "bias" from movie rating data.

Graduate Coursework

Probability & Measure Theory, Computer Vision, Graphical Models & Inference, Machine Learning, Advanced Machine Learning, Stochastic Processes, Statistical Inference, Design & Analysis of Algorithms

Teaching

Fall 2014 TA & Recitation, STA 561: Probabilistic Machine Learning (graduate)
Spring 2014 TA, CPS 270: Introduction to Artificial Intelligence (undergraduate)

Honors and Awards

2013 – 2015 **Duke Graduate Fellowship**.
2012 **Outstanding Winner in 2012 Interdisciplinary Contest in Modeling (0.3%)**.
COMAP, sponsored by SIAM, NSA and INFORMS
2012 **Outstanding Student of the University (0.2%)**.
University of Electronic Science and Technology of China
2009 – 2011 **National Scholarship**.
Ministry of Education of China

Skills

Programming C/C++, Python, MATLAB, R
Language English (fluent), Chinese (native)

Publications

Peer Reviewed

[1] **Fangjian Guo**, Charles Blundell, Hanna Wallach, and Katherine A. Heller. The Bayesian Echo Chamber: Modeling influence in conversations. *AISTATS*, 2015 (to appear).

[2] **Fangjian Guo**, Zimo Yang, and Tao Zhou. Predicting link directions via a recursive subgraph-based ranking. *Physica A: Statistical Mechanics and its Applications*, 392(16), 2013.

Working Papers

[3] **Fangjian Guo** and Henry D. Pfister. An EM-BP algorithm for matrix completion.

[4] **Fangjian Guo** and David B. Dunson. Bayesian multiplicative calibration models for recommender systems.

[5] **Fangjian Guo**, Zimo Yang, Zhidan Zhao, and Tao Zhou. The relation between memory and power-law exponent.

Workshop Papers

[6] **Fangjian Guo**, Charles Blundell, Hanna Wallach, and Katherine A. Heller. The Bayesian Echo Chamber: Modeling power and influence with mutually exciting processes and dynamic language models. In *The 5th Annual Text as Data Conference*, Kellogg School of Management, Northwestern University, October 2014.

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