Bryan Hooi

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Education

Carnegie Mellon University (2014 - 2016) • Joint Ph.D. in Statistics and Machine Learning
GPA: 4.00/4.00

Stanford University (2010 - 2014) • B.S. (Honors) in Mathematics, M.S. in Computer Science
Undergraduate GPA: 3.93/4.30 • Masters GPA: 4.30/4.30

Research Interests

- Graph Mining, Anomaly Detection, Time Series Data Analysis

Honors and Awards

- SIGKDD Best Research Paper Award 2016
- Undergraduate Research Award, 2014 (given for the top honors theses in the Stanford mathematics department)
- Top 120 in the William Lowell Putnam Mathematical Competition in 2012. Awarded the Two Sigma award for excellence in mathematics problem solving.
- 4th in 2010 and 5th in 2011 in ACM-ICPC programming regional contest.
- Bronze medals at International Mathematical Olympiads in 2006 and 2007.

Conference Publications

1. Kijung Shin, Bryan Hooi, Jisu Kim, and Christos Faloutsos. "D-Cube: Dense-Block Detection in Terabyte-Scale Tensors," ACM International Conference on Web Search and Data Mining (WSDM) 2017 (to appear)
2. Kijung Shin, Bryan Hooi, and Christos Faloutsos. "M-Zoom: Fast Dense-Block Detection in Tensors with Quality Guarantees," European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD) 2016.
3. Bryan Hooi, Hyun Ah Song, Alex Beutel, Neil Shah, Kijung Shin, and Christos Faloutsos. FRAUDAR: Bounding Graph Fraud in the Face of Camouflage. KDD 2016. **KDD Best Paper Award (Research Track)**
4. Bryan Hooi, Neil Shah, Alex Beutel, Stephan Gunnemann, Leman Akoglu, Mohit Kumar, Disha Makhija, and Christos Faloutsos. "BIRDNEST: Bayesian Inference for Ratings-Fraud Detection," SIAM International Conference on Data Mining (SDM) 2016,
5. Bryan Hooi, Hyun Ah Song, Evangelos Papalexakis, Rakesh Agrawal, and Christos Faloutsos. "Matrices, Compression, Learning Curves: formulation, and the GROUPNTEACH algorithms," Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD) 2016.
6. Meng Jiang, Alex Beutel, Peng Cui, Bryan Hooi, Shiqiang Yang, and Christos Faloutsos. "A General Suspiciousness Metric for Dense Blocks in Multimodal Data". IEEE International Conference on Data Mining (ICDM) 2015.

Journal Publications

1. Meng Jiang, Alex Beutel, Peng Cui, Bryan Hooi, Shiqiang Yang, and Christos Faloutsos. "Spotting Suspicious Behaviors in Multimodal Data: A General Metric and Algortihms," IEEE Transactions on Knowledge and Data Engineering (TKDE) 2016.
2. Evangelos E. Papalexakis, Bryan Hooi, Konstantinos Pelechrinis, and Christos Faloutsos. "Power-Hop: A Pervasive Observation for Real Complex Networks," PLoS ONE 11(3) 2016.

Workshop Publications

1. Bryan Hooi, Hyun Ah Song, Evangelos Papalexakis, Rakesh Agrawal and Christos Faloutsos. "Education, Learning and Information Theory," IEEE ICDM Workshop on Data Mining for Educational Assessment and Feedback, 2015.

Employment and Activities

Stanford University Department of Statistics (2013)
Honors Thesis Project

- Designed and implemented a Bayesian inference algorithm that uses Markov Chain Monte Carlo to infer infectious disease contact networks by combining genetic and epidemiological data.
- Tested the inference algorithm on simulated data, applied it to genetic sequence data from the H1N1 influenza pandemic, and used the results to estimate the basic reproductive number of the H1N1 pandemic.

Google (2013)
Software Engineering Intern

- Conducted 3 data analysis projects and experiments using R and C++: 1) improving the click prediction model using additional features; 2) analyzing the effect of user information for ad selection through experiments; 3) conducting a randomized experiment to test and quantify the effect of ads on several metrics of user behavior.

Stanford University Statistics Department (2012)
Summer Research Project

- Constructed statistical models to analyze the structure of human commensal microorganism communities.
- Wrote R software to provide other researchers with a simple interface for applying the Latent Dirichlet Allocation and Hierarchical Latent Dirichlet Allocation models to visualize hierarchical relationships between the species present in a microbiome dataset.

National Univesity of Singapore (2008-2010)
Trainer for Singapore International Mathematical Olympiad Team

- Trained a group of 20 students for the International Mathematical Olympiad. Planned syllabus, developed instructional materials, conducted lectures and problem-solving sessions, conducted training camp, and graded quizzes and competitions.

PPH Community Services Center (2006-2010)
Volunteer Tutor

- Tutored underprivileged and academically struggling students in english, math and science twice a week. Organized lesson plans and delivered lessons both classroom style and one-to-one.

Graduate Coursework

36-755 Advanced Statistics
10-715 Advanced Machine Learning
15-826 Multimedia Databases
36-757 Advanced Data Analysis
36-752 Advanced Probability
10-725 Convex Optimization

Programming Languages

- C++, Matlab, R, Python, C, Objective-C, Java, Javascript

Other Projects

Ethnic Conflict Data Visualization (2012)

- Designed, processed data for, and coded a data visualization using Javascript and d3 relating civil war in a country to ethnic political structure and changes. The project was done in a team of 4 and can be found at:
  http://www.andrew.cmu.edu/user/bhooi/projects/fractionalized_world/conflict.html

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