Wei Sun, Ph.D.

Fairfax, VA
Email: **wsun18@gmail.com**
Current Status: **U.S. Permanent Resident**
Tel: **(571)318-9858**

Summary

Detail-Oriented algorithmic developer and agile problem solver well versed in analyzing customized system needs and designing computationally efficient algorithms. Excels at collaborating in teamwork and always willing to learn from challenges with self-motivation.

Highlights & Specialties

- Expert of Bayesian inference algorithms – I am the author of papers published in top machine learning conference UAI and IEEE Transactions.
- Research programmer proficient in Matlab, Python, C, SAS, etc. – I am a committer for the popular open source BayesNet Toolbox (downloads more than 50,450 since 2010. url: **https://code.google.com/p/bnt/**).
- Hands-on experiences in customer segmentation, demand forecasting, revenue management, using statistical machine learning methods (logistic regression, SVM, NN, Bayesian network, random forest, PCA, etc.) .
- Core backend developer for the first combinatorial prediction market (crowdsourced future events forecasting) **https://scicast.org/**, in charge of developing efficient & highly scalable algorithms for maintaining market distribution and managing user's assets.
- Extensive software testing experience using automatic robot framework.
- Green Card Holder in the category of outstanding researcher.

Work Experience

Senior Algorithm Engineer Delphi Automotive, Electronic & Safety, Feb. 2015 ~ present

- Maintain and develop object tracking algorithms based on different radar configurations. Provide customized output features such as blind zone alert, close vehicle warning, etc. Apply machine learning methods to improve classifications on noise radar detections.

Senior Research Scientist United Technologies Research Center, Sep. 2014 ~ Jan. 2015

- Maintained data integrity and consistency with focused cleanup initiatives for business unit's data files;
- Derived higher order features from original variables for diagnostic problem and analyzed the core drivers of the failures.
- Provided various data visualizations for management team's insights.
- Conducted data-driven analysis to guide lab simulation.
- Proficient in using Python for large-scale data check, importing into and retrieving from database, and using scikit-learn for machine learning tasks.

Research Scientist George Mason University, Sep. 2009 ~ Sep. 2014

- Achieved scalability in order of magnitude by developing efficient trade-based asset model using dynamic junction tree for https://SciCast.org/, a combinatorial prediction market for science & technology forecasting.
- Led extensive software testing using manual, equivalent class partitioning, randomized cases, regression set, and simulation, in automatic robot framework.
- Improved market performance by auto-trader using Kelly rule optimization trading tool with demonstrated asset gain in simulation.
- Led research, prototyping, implementing, then worked with software engineering team to deliver the final production system for prediction markets.
- Increased estimate accuracy and computational efficiency using distributed probabilistic inference algorithms for mixed discrete and continuous model.
- Hands-on experience in nonlinear filtering/tracking, multi-sensor fusion, target recognition, and high-level information fusion including situation assessment.

Senior Analyst United Airlines, Dec. 2007 ~ Sep. 2009

- Created demand forecasting model for airlines revenue management using probabilistic graphical model Bayesian networks, and customized the model for different United Airlines flights.
- Developed discrete choice model for alternative itineraries across airlines using logistic regression
- Analyzed market behaviors and developed customer segmentation model for yieldable and priceable demands with better estimates.
- Excellent skills for data extraction, pre-processing, data cleaning, statistical analysis, using SQL and SAS.

Education

- Ph.D. in Information Technology — George Mason University, December 2007
- M.S. in Operation Research — George Mason University, May 2003
- B.S. in Electrical Engineering — Zhejiang University, July 1991

Skills

- Programming: Python, Matlab, C, SAS, SQL
- Technical: maximum likelihood, maximum a posterior, Markov Chain Monte Carlo, logistic regression, neural networks, support vector machine, importance sampling, Bayesian networks, Bayesian hierarchical model, naïve Bayes, Gaussian mixture models, Junction tree inference, message passing, etc.

Selected Publications

- W. Sun, K. Laskey, C. Twardy, R. Hanson, B. Goldfedder. "***Trade-based Asset Model using Dynamic Junction Tree for Combinatorial Prediction Markets***". Proceedings of the MIT Collective Intelligence Conference 2014, June, Massachusetts Institute of Technolgy.

- W. Sun, R. Hanson, K. Laskey, C. Twardy. "***Learning Parameters by Prediction Markets and Kelly Rule for Graphical Models***". Proceedings of the 2013 UAI Application Workshop: Big Data Meets Complex Models, Bellvue, WA, USA, 2013.
- W. Sun, R. Hanson, K. Laskey, C. Twardy. "***Probability and Asset Updating using Bayesian Networks for Combinatorial Prediction Markets***". Proceedings of the 28th Conference on Uncertainty in Artificial Intelligence (UAI), Catalina Island, USA, 2012.
- W. Sun, K.C. Chang, and K. Laskey. "***Scalable Inference for Hybrid Bayesian Networks with Full Density Estimation***". Proceedings of the 13th International Conference on Information Fusion (FUSION), Edinburgh, UK, 2010.
- W. Sun, K.C. Chang. "***Message Passing for Hybrid Bayesian Networks: Representation, Propagation and Integration***". IEEE Trans. on Aerospace and Electronic Systems, Vol. 45, No. 4, pp.1525-1537, October, 2009.

Honors & Awards

- Outstanding Reviewer, IEEE Transactions on Automatic Control (2012)
- AAAI Scholarship and Travel Award (2007)
- Merit-based Ph.D. Fellowship, George Mason University (2003-2007)
- Academic Excellence (GPA 4.0 out of 4.0), George Mason University (2003)

Personal Interests

Singing, and song recording; swimming; basketball; making delicious food. Enjoy life ☺

Referral

Available upon request.