

MA, YIFEI

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EDUCATION

Ph.D. student in machine learning. **Carnegie Mellon University**, 2011 – May 2017 (expected).

Advisor: Jeff Schneider, AutonLab.

Thesis proposal: Active Search and Bandit Methods for Complex Actions and Rewards

- Idea: to use machine learning tools in an unknown environment while end users actively provide feedback in real time, so as to maximize the end users' cumulative utility in the long term.
- Related areas: Bayesian optimization, reinforcement learning, contextual bandits, active search.
- Applications: parameter tuning; recommendation; search; drug discovery; opinion polling; robotics.

B.S. in automation and controls; dual major in mathematics. **Tsinghua University**, 2007 – 2011.

Main thesis: Robust Support Vector Machine Using Least Median Loss Penalty [7].

Dual thesis: Primal-Dual Approximation Algorithms for NP-Hard Problems [13].

Exchange study in **Georgia Institute of Technology**. Fall 2009.

EXPERIENCE

Summer internship (quantitative researcher). **Citadel LLC**, May – August 2014.

- Wrote C and R codes for feature selection (Lasso/stage-wise/ridge regression), which significantly improved out-sample prediction accuracy for stock pricing, by avoiding overfitting;
- Applied Bayesian linear regression and Gaussian processes to predict billions of transactions;
- Discovered outliers from initial processing and explained them by special financial events; provided various methods (truncation, reweighting, and normalization) to improve robustness.
- Reported comprehensive evaluations for every combination of methods, data, and metrics and found consistent and significant improvements across all metrics.

REFERRED PAPERS

1. **Yifei Ma**, Roman Garnett, Jeff Schneider. "Active Search for Sparse Signals with Region Sensing." *Association for the Advancement of Artificial Intelligence (AAAI)*. 2017.
2. **Yifei Ma**, Tzu-Kuo Huang, Jeff Schneider. "Active Search and Bandits on Graphs Using Sigma-Optimality." *Uncertainty in Artificial Intelligence (UAI)*. 2015.
3. **Yifei Ma**, Dougal J. Sutherland, Roman Garnett, Jeff Schneider. "Active Pointillistic Pattern Search." *Artificial Intelligence and Statistics (AISTATS)*. 2015. *shared first-authorship.
4. **Yifei Ma**, Roman Garnett, Jeff Schneider. "Active Area Search via Bayesian Quadrature." *Artificial Intelligence and Statistics (AISTATS)*. 2014.
5. **Yifei Ma**, Roman Garnett, Jeff Schneider. " Σ -optimality in Active Learning on Gaussian Random Fields." *Neural Information Processing Systems (NIPS)*. 2013.
6. Tongbo Huang, Guangyu Xia, **Yifei Ma**. "MidiFind: Fast and Effective Similarity Searching in Large MIDI Databases." *Symposium on Computer Music Multidisciplinary research (CMMR)*. 2013.
7. **Yifei Ma**, Li Li, Xiaolin Huang, Shuning Wang. "Robust Support Vector Machine Using Least Median Loss Penalty." *18th International Federation of Controls World Congress (IFAC)*. 2011.

WORKSHOP PAPERS

8. **Yifei Ma**, Roman Garnett, Jeff Schneider, Andrew Gordon Wilson. "Fast Bayesian Optimization via Conjugate Sampling." *Practical Bayesian Nonparametric, NIPS Workshop on*. 2016.

9. **Yifei Ma**, Roman Garnett, Jeff Schneider. “Submodularity in Batch Active Learning and Survey Problems on Gaussian Random Fields.” *Discrete Optimization, NIPS Workshop on*. 2012.

PROJECTS

10. **Yifei Ma**, Ying Yang. “Cartoon Face Detection with Deformable Parts Model.” *computer vision course project*. 2013.
11. Junier Oliva, Dougal J. Sutherland, **Yifei Ma**. “Finding Representative Objects with Sparse Modeling: Available Methods.” *convex optimization best course project*. 2013.
12. **Yifei Ma**, Xiaoqi Yin. “Cross-Validate Kernel Density Estimators for Total Variation with Yatracas Class.” *statistical machine learning course project*. 2012.
13. **Yifei Ma**. “Primal-Dual Approximation Algorithms for NP-Hard Problems.” *undergraduate math thesis*. 2011.

TALKS

14. “Active Search and Bandits Methods for Complex Actions and Rewards.” *Beihang University Big Data Invited Talk*. URL: <http://www.cnbigdata.org.cn/> 2015.
15. “Sigma-Optimality for Active Learning on Gaussian Random Fields.” *CMU Machine Learning Lunch Seminar*. URL: <http://www.cs.cmu.edu/~learning/> 2013.

SERVICE

Reviewer for Neural Information Processing Systems (NIPS) 2014 – 2016.
Masters Admissions Committee for Machine Learning Department.

TEACHING

Spring 2013 Statistical Machine Learning (Teaching Assistant, by Larry Wasserman and Aarti Singh).
Fall 2013 Convex Optimization (Teaching Assistant, by Barnabas Poczos and Ryan Tibshirani).

CODING

Python/Matlab/R GP extensions in [2–4], deformable parts model [10], optimization [11]; **C++** dynamic time wrapping, R-trees [6], particle filters, embedded systems; **DBMS** MongoDB, Hadoop, HDF5.

COURSES

Machine learning (A+), Intermediate Statistics (A+), Statistical Machine Learning (A), Graduate Algorithms (A-), Optimization (A+), Multimedia Databases and Data Mining (A), Advanced Probability Overview (A+), Computer Vision (A).

HONORS AND AWARDS

2007-2010 Academic Scholarship by being the top student in Automation Department every year;
10/2009 31/700 in IEEEExtreme 24-Hour Programming Competition (team leader);
10/2006 1st prize in National High School Physics Competition;
03/2006 Qualified for the American Invitational Mathematics Examination;
10/2004 1st prize in National High School Math Competition (over 2 years younger than most others)

REFERENCES

Jeff Schneider (Advisor). Carnegie Mellon University. schneide@cs.cmu.edu
Roman Garnett. Washington University in St, Louis. garnett@wustl.edu
Aarti Singh. Carnegie Mellon University. aarti@cs.cmu.edu