

Scott Alfeld

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INTERESTS Statistical machine learning and data analysis. Specifically machine teaching and adversarial learning.

EDUCATION

University of Wisconsin – Madison, Department of Computer Sciences

- Ph.D. in Computer Science (Minor: Mathematics), Expected 2017 Aug 2011 –
 - Co-Advisers: Paul Barford and Xiaojin (Jerry) Zhu
- Master’s Degree in Computer Science Aug 2011 – Jun 2015
 - Adviser: Paul Barford

University of Southern California, Department of Computer Science Aug 2009 – Aug 2011

- Ph.D. Program, no degree (Transferred to UW – Madison)
 - Adviser: Fei Sha

University of Utah, School of Computing

- Bachelor’s of Science in Computer Science Aug 2004 – Aug 2008
 - Adviser: Hal Daumé III

PUBLICATIONS

CONFERENCE PAPERS

- [S. Alfeld](#), X. Zhu, P. Barford “Explicit Defense Actions Against Test-Set Attacks” in *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI ’17)*, Feb 2017.
- A. Cahn, [S. Alfeld](#), P. Barford, S. Muthukrishnan “What’s in the Community Cookie Jar?” in *Proceedings of the IEEE/ACM Conference on Advances in Social Network Analysis and Mining (ASONAM ’16)*, Aug 2016.
- [S. Alfeld](#), X. Zhu, P. Barford “Machine Teaching as Search” (Short Paper) in *Proceedings of the Symposium on Combinatorial Search (SoCS ’16)*, Jul 2016.
- [S. Alfeld](#), X. Zhu, P. Barford “Data Poisoning Attacks Against Autoregressive Models” in *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI ’16)*, Feb 2016.
- A. Cahn, [S. Alfeld](#), P. Barford, S. Muthukrishnan “An Empirical Study of Web Cookies” in *Proceedings of the World Wide Web Conference (WWW ’16)*, Apr 2016.
- M. Malloy, [S. Alfeld](#), P. Barford “Contamination Estimation via Convex Relaxations” in *Proceedings of IEEE International Symposium on Information Theory (ISIT ’15)*, Jun 2015.
- [S. Alfeld](#), P. Barford “Targeted Residual Analysis for Improving Electric Load Forecasting” in *Proceedings of IEEE Energy Conference (Energycon ’14)*, May 2015.
- [S. Alfeld](#), C. Barford, P. Barford “Toward an Analytic Framework for the Electrical Power Grid” in *Proceedings of the Third International Conference on Future Energy Systems (e-Energy ’12)*, May 2012.

WORKSHOP PAPERS

- X. Zhang, H. Ohannessian, A. Sen, [S. Alfeld](#), X. Zhu “Optimal Teaching for Online Perceptrons” in *Constructive Machine Learning at NIPS 2016*, Feb 2017.
- [S. Alfeld](#), P. Barford, X. Zhu “Optimal Defense Actions Against Test Set Attacks” in *ICML Workshop on Reliable Machine Learning in the Wild*, Jun 2016.
- [S. Alfeld](#), K. Berkele, S. DeSalvo, T. Pham, D. Russo, L.J. Yan, M.E. Taylor “Reducing the Team Uncertainty Penalty: Empirical and Theoretical Approaches” in *Proceedings of the AAMAS workshop on Multiagent Sequential Decision Making in Uncertain Domains*, May 2011.
- [S. Alfeld](#), M.E. Taylor, P. Tandon, M. Tambe “Towards a Theoretic Understanding of DCEE” in *Proceedings of the AAMAS Distributed Constraint Reasoning workshop*, May 2010.

ADDITIONAL POSTERS	▪ <i>Machine Learning in the Presence of an Adversary</i> 2016 Greater Chicago Area Systems Research Workshop (GCASR)
	▪ <i>Improving Energy Efficiency: A Data-Driven Approach</i> 2013 ACM SIGKDD Conference on Knowledge Discovery and Data Mining
	▪ <i>Understanding and Improving the Electric Grid</i> 2012 Wisconsin Institute on Software-Defined Datacenters Of Madison (WISDOM)
AWARDS	▪ Cisco Distinguished Graduate Fellowship 2016-2017 One of two annual awards for graduate students in UW's CS department. Provides tuition and a stipend for 9 months. Based on "academic merit, creativity, research accomplishments and commitment to research."
	▪ Student Travel Grant, SoCS '16 2016 Award covering airfare. Application open to US-citizen students attending the conference.
	▪ Student-voted Favorite Talk for UW's <i>Estimating Functions From Data</i> 2012 Talk Title: <i>Maximum Covariance Unfolding</i> A \$200 award determined by vote amongst UW's STAT 838 Students.
	▪ Center for Risk and Economic Analysis of Terrorism Events (CREATE) Fellowship 2010-2011 Part of the DHS Career Development Student Fellowship Program. Provides tuition and a stipend for 12 months. Award based on "student's academic record and submitted test scores, recommendation letters, and essay."
	▪ University of Utah <i>School of Computing Outstanding Teaching Assistant Award</i> 2008 - 2009 An annual award to up to two teaching assistants in the School of Computing.
ACADEMIC SERVICE	CONFERENCES
	▪ WWW 2017 PC Member (Reviewer) 2017
	▪ AISTATS 2017 Workflow Chair 2016 - Present
	▪ ICML Student Volunteer 2016
	▪ Energycon 2014 Reviewer 2014
	LOCAL
	▪ LUCID (https://lucid.wisc.edu) Senior Graduate Mentor 2016 - Present
	▪ Head coordinator of the Artificial Intelligence Reading Group, UW Madison 2014 - Present
	▪ Co-coordinator of the Time Series Analysis Reading Group, UW Madison 2015
WORK EXPERIENCE	▪ <i>comScore</i> Intern 2014 I worked with their data scientists toward designing, implementing, and deploying an anomaly detection system.
	▪ <i>mDotLabs</i> (acquired by comScore) Contractor 2014 I designed and implemented a statistical model evaluation framework.
	▪ <i>The Eric and Wendy Schmidt Data Science For Social Good Fellowship</i> 2013 I led the Energy Team. We built a tool to profile a building's electricity usage, and audited several facilities for the Illinois Department of Corrections to improve their energy efficiency.
PATENT	▪ M. Malloy, S. Alfeld and P. Barford, "Creative Impression and Pageview Fraud Detection and Estimation", US patent pending 2015
INVITED TALKS	▪ <i>Time Series Forecasting in the Presence of an Adversary</i> Nov 2015 Lecture for the Human, Animal, and Machine Learning: Experiment and Theory (HAMLET) organization
	▪ <i>Improving Load Forecasting by Augmenting the MISO Model</i> Sep 2012 Presentation to the Load Forecasting Team of Midwest ISO (MISO)
	▪ <i>Analyzing the Grid via Wholesale Electricity Markets</i> Feb 2012 Presentation to the BACTER Institute at UW Madison

**TEACHING
EXPERIENCE**

COURSES TAUGHT

- CS540 – Artificial Intelligence, UW – Madison 2015
I taught the whole course as the sole instructor.
I lectured three times a week for ~100 upper-division undergrad and graduate students, and coordinated two TAs. I used the Berkeley Pacman framework for programming assignments, and created my own lecture notes, written assignments, in-class activities, programming tutorials and exams.
Class content available at www.cs.wisc.edu/~salfeld/cs540.

TEACHING ASSISTANTSHIPS

- Machine Learning
 - University of Southern California 2010
 - University of Utah 2008
- Artificial Intelligence
 - University of Southern California 2010
 - University of Utah 2008, 2009
- Computer Science II – Entertainment Arts and Engineering program
 - University of Utah 2008
- Computer Science II
 - University of Utah 2008
- Computer Science I
 - University of Utah 2007, 2008
- Applications of Natural Language Processing
 - University of Utah 2007
- Introduction to C
 - University of Utah 2006
- Introduction to UNIX
 - University of Utah 2006(×2), 2007(×2), 2008

K-12

- Volunteer Assistant Debate Coach for *East High School*, Salt Lake City, Utah 2004–2006
I coached the novice class, giving bi-weekly lectures.
I gave guest lectures to the advanced debate and theater classes, and served as a judge and organizer for various state-wide debate tournaments.
- Algebra 1A Teaching Assistant, *East High School*, Salt Lake City, Utah 2003

SELECTED GUEST LECTURES

- *Trustworthy Data Analysis* Jun 2016
Guest Lecture for WCATY’s Topics in Computer Science course
- *Toward Adversarial Learning* Jul 2015
Guest Lecture for WCATY’s Artificial Intelligence Course
- *The PCP Theorem* Dec 2013
A collection of four lectures covering the PCP (Probabilistically Checkable Proofs) theorem, its connection to hardness of approximation, and expander graphs for UW’s graduate level computational complexity course.
- *Projecting Intuition into High-Dimensional Spaces* May 2011
Lecture for the Machine Learning Reading Group, University of Southern California
- *Measures, Metrics, and in Between: Bregman Divergences* Apr 2009
Lecture for Algorithms Seminar
- *Learning Finite Automata* Aug 2009
Lecture for Seminar on Learning Theory
- *Algebraic Fingerprinting and Freivald’s Technique* Nov 2008
Lecture for CS6150 – Graduate Algorithms
- *Min-Cut and Randomization* Nov 2008
Lecture for CS6150 – Graduate Algorithms

VOLUNTEER WORK	▪ <i>Wisconsin Science Festival</i>	2016
	▪ <i>LockDown</i> IT Security event	2015
	▪ 2014 Milwaukee Maker Faire	2014
	▪ American Player's Society, Madison, WI	2011
	▪ Hi-GEAR High School Girl's Outreach Program, Salt Lake City	2008
	▪ University of Utah School of Computing High School Programming Competition	2007
	▪ National Forensics League National Tournament, Salt Lake City	2004
SELECTED SOFTWARE PROJECTS	▪ TEDUSearch: Machine Teaching as Search, Python	2016 – Present
	▪ Quokka: A General Purpose Machine Learning Toolkit, Python	2010 – 2014
	▪ Numerical Stability of Linear Methods in Machine Learning, an Empirical Study	2013 – 2014
	▪ Exploration of Dimensionality Reduction Techniques, Python	2011
	▪ Conflicting Visual Cues in Human Visual System, C++/Python	2010
	▪ Sokuban AI, C++	2008
	▪ Semantic Net Implementation, C++	2008
	▪ Sugar Glider 3D Model, Maya	2008
	▪ Halting Problem in HOL-4 (With Prof. Konrad Slind)	2008
	▪ Authorship Identification System, C++/Perl	2007
	▪ Propositional Logic Inference Program, C++	2006
	▪ Information Retrieval System for Disease Outbreaks, Java	2006
	HOBBIES	Juggling, Locksport, Astronomy, Hiking, Friendship