

## Adith Swaminathan

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## Research Interests

Machine Learning for Interactive Systems  
Bandits • Causality • Reinforcement Learning • Machine Learning Applications

## Education

2011 -

### Cornell University

Ph.D. in Computer Science

- Graduate Minor in Applied Math
- Advisor: Thorsten Joachims
- Thesis: Counterfactual Evaluation and Learning from Logged User Feedback
- Grade Point Average: 4.187 / 4.3
- Committee: Thorsten Joachims, Johannes Gehrke, Éva Tardos, Robert Kleinberg

2014

### Cornell University

M.Sc. in Computer Science

2006 - 2010

### Indian Institute of Technology, Bombay

B.Tech. in Computer Science & Engineering

- Thesis: Learning Many-Many Matchings
- Advisor: Soumen Chakrabarti
- Cumulative Performance Index : 9.32 / 10

## Awards

- 2017 Best Paper Award at The 10th ACM International Conference on Web Search and Data Mining  
2016 Best Presentation at The 2nd International Conference on the Theory of Information Retrieval  
2015, 2012 Exemplary Performance as a Graduate Teaching Assistant  
2009 The OP Jindal Scholarship for excellence in leadership  
2006 Central Board of Secondary Education Merit Scholarship for excellence in All India Engineering Entrance Examinations

## Publications

### JOURNALS

- 2015 Batch Learning from Logged Bandit Feedback through Counterfactual Risk Minimization
- *Adith Swaminathan*, Thorsten Joachims
  - Journal of Machine Learning Research Special Issue in Memory of Alexey Chervonenkis
  - Citations: 8

### CONFERENCES

- 2017 Unbiased Learning-to-Rank with Biased Feedback
- Thorsten Joachims, *Adith Swaminathan*, Tobias Schnabel
  - In proceedings of The 10th ACM International Conference on Web Search and Data Mining
  - Citations: 2
  - *Best Paper Award*

- 2016 Recommendations as Treatments: Debiasing Learning and Evaluation
- Tobias Schnabel, *Adith Swaminathan*, Ashudeep Singh, Navin Chandak, Thorsten Joachims
  - In proceedings of The 33rd International Conference on Machine Learning
  - Citations: 4
- 2016 Unbiased Comparative Evaluation of Ranking Functions
- Tobias Schnabel, *Adith Swaminathan*, Peter Frazier, Thorsten Joachims
  - In proceedings of The 2nd International Conference on the Theory of Information Retrieval
  - *Best Presentation Award*, presented to Tobias Schnabel
- 2016 Counterfactual Evaluation and Learning for Search, Recommendation and Ad Placement
- *Adith Swaminathan*, Thorsten Joachims
  - In proceedings of The 39th International ACM SIGIR Conference on Research and Development in Information Retrieval
  - Citations: 1
- 2015 The Self-Normalized Estimator for Counterfactual Learning
- *Adith Swaminathan*, Thorsten Joachims
  - In proceedings of The 29th Annual Conference on Neural Information Processing Systems
  - Citations: 6
- 2015 Counterfactual Risk Minimization: Learning from Logged Bandit Feedback
- *Adith Swaminathan*, Thorsten Joachims
  - In proceedings of The 32nd International Conference on Machine Learning
  - Citations: 14
- 2014 Mining Videos from the Web for Electronic Textbooks
- Rakesh Agrawal, Maria Christoforaki, Sreenivas Gollapudi, Anitha Kannan, Krishnaram Kenthapadi, *Adith Swaminathan*
  - In proceedings of The 12th International Conference on Formal Concept Analysis
  - Citations: 7
- 2013 Beyond Myopic Inference in Big Data Pipelines
- Karthik Raman, *Adith Swaminathan*, Johannes Gehrke, Thorsten Joachims
  - In proceedings of The ACM SIGKDD Conference on Knowledge Discovery and Data mining
  - Citations: 5
- 2012 Temporal Corpus Summarization using Submodular Word Coverage
- Ruben Sipos, *Adith Swaminathan*, Pannaga Shivaswamy, Thorsten Joachims
  - In proceedings of The International Conference on Information and Knowledge Management
  - Citations: 32
- WORKSHOPS
- 2016 Large-scale Validation of Counterfactual Learning Methods: A Test-Bed
- Damien Lefortier, *Adith Swaminathan*, Xiaotao Gu, Thorsten Joachims, Maarten de Rijke
  - In The 30th Annual Conference on Neural Information Processing Systems Workshop on Inference and Learning of Hypothetical and Counterfactual Interventions in Complex Systems
- 2016 Off-Policy Evaluation for Slate Recommendation
- *Adith Swaminathan*, Akshay Krishnamurthy, Alekh Agarwal, Miroslav Dudík, John Langford, Damien Jose, Imed Zitouni
  - In proceedings of The 33rd International Conference on Machine Learning
  - Citations: 3
- 2015 Unbiased Ranking Evaluation on a Budget
- Tobias Schnabel, *Adith Swaminathan*, Thorsten Joachims
  - In proceedings of The 24th International Conference on World Wide Web
  - Citations: 1
- 2015 Counterfactual Risk Minimization
- *Adith Swaminathan*, Thorsten Joachims
  - In proceedings of The 24th International Conference on World Wide Web
  - Citations: 4

## WORKING PAPERS

Deep Learning with Logged User Feedback

- *Adith Swaminathan*, Artem Grotov, Maarten de Rijke, Thorsten Joachims

Off-Policy Evaluation and Optimization for Slate Recommendation

- *Adith Swaminathan*, Akshay Krishnamurthy, Alekh Agarwal, Miroslav Dudík, John Langford

Mini-Max Optimal Off-Policy Exploration

- Yuhuai Wu, *Adith Swaminathan*, Lihong Li

## Invited Talks

- 2017 Building Recommenders and Search Engines by Re-using Logged User Feedback  
*Keynote Talk*  
At The 3rd International Workshop on Machine Learning Methods for Recommender Systems  
Houston, U.S.A.
- 2017 Causal Data Mining  
*Keynote Talk*  
At INFORMS Annual Meeting  
Houston, U.S.A.
- 2016 Preferences and Counterfactuals: Learning from Logged Implicit Feedback  
At The 28th European Conference on Operational Research  
Poznan, Poland
- 2016 Counterfactual Risk Minimization for Interactive Learning Systems  
At The Search Engines Amsterdam Meetup  
Amsterdam, Netherlands
- 2015 Using Logs of Interactive Systems for Fun and Profit  
At Microsoft Research  
Cambridge, U.K.

## Teaching

- 2016 Tutorial at The 39th International ACM SIGIR Conference  
• Counterfactual Evaluation and Learning for Search, Recommendation and Ad Placement  
• Co-taught by Thorsten Joachims
- 2015 Teaching Assistant for CS 6780: Advanced Machine Learning  
• Was awarded for *exemplary performance as a Graduate Teaching Assistant*
- 2011, 2014 Teaching Assistant for CS 4780/5780: Machine Learning
- 2012 Teaching Assistant for CS 2110: Object-Oriented Programming and Data Structures  
• *Homework Czar*, in charge of creating, grading and quality control of all homeworks  
• Was awarded for *exemplary performance as a Graduate Teaching Assistant*

## Industry Experience

- 2015 Research Intern, Machine Learning group at Microsoft Research NYC  
• Developed off-policy estimators that evaluate policies for contextual combinatorial bandits  
• Mentor: Miroslav Dudík and John Langford
- 2013 Research Intern, Computer Human Interactive Learning group at Microsoft Research Redmond  
• Developed interpretable text classification methods that need very little training data  
• Mentor: David Grangier and Carlos Garcia
- 2012 Research Intern, Search Labs at Microsoft Research Silicon Valley Center  
• Explored methods to automatically augment textbooks with relevant high quality videos  
• Mentor: Krishnaram Kenthapadi, and Rakesh Agrawal, Sreenivas Gollapudi and Anitha Kannan

- 2010 - 2011 Strategist, Tower Research Capital
- Conceptualized and implemented several profitable automated high frequency trading systems
  - Wrote high performance protocol implementations for many electronic trading exchanges
  - Developed critical monitoring, alerting and broadcasting systems
- 2009 Software Development Engineer (Testing) Intern, Microsoft R&D India Development Center
- With the Office Mobile team, in charge of Excel Mobile testing and performance benchmarking
  - Created an add-in for Visual Studio on my own initiative that automated stress-tests and improved test team productivity many-fold

## Community Activities

- 2017 Reviewer, AISTATS, AACL, KDD, ICML
- 2016 Organized NIPS 2016 Workshop on Inference and Learning of Hypothetical and Counterfactual Interventions in Complex Systems
- 2016 Reviewer, ICML, NIPS, KDD, AISTATS, EVIA, ICTIR
- 2015 Reviewer, NIPS, KDD, DIR
- 2014 Reviewer, NIPS
- 2012 Reviewer, CIKM, SIGIR (Secondary), AACL (Secondary)

## Other Activities

- 2012 - 2015 Board Member and Webmaster of the Society for the Promotion of Indian Classical Music And Culture Amongst Youth (SPICMACAY) Cornell Chapter
- 2007 - 2008 Coordinator of the Pro-Nites concerts at Mood Indigo, IIT Bombay's cultural festival
- 2007 - Trained Carnatic singer (a style of Indian Classical Music)
- 2006 - 2007 Represented IIT Bombay in Mumbai Division Football Association League (Soccer) and in the Inter-IIT Tournament, and won the Institute Football League twice
- 2004 Won the Division 2 title in the Mumbai School Sports Association Soccer tournament
- 2002 - 2010 Won several prizes in English Extempore speaking, Mock Courtroom Trials, Potpourri Championships, Parliamentary Debates, Essay Writing and Poetry Composition Competitions

## Graduate Coursework

### Cornell University

- Data-Sparse Matrix Computations
- Algorithmic Game Theory
- Analysis of Algorithms
- Bayesian Statistics and Data Analysis
- Optimal Learning
- Advanced Topics in Machine Learning
- Machine Learning Theory
- Counterfactual Machine Learning
- Structure of Information Networks
- Advanced Topic Modeling
- Advanced Language Technologies
- Advanced Database Systems
- Advanced Programming Languages

### IIT Bombay

- Foundations of Machine Learning
- Information Retrieval & Mining for the Web
- New Trends in Information Technology
- Organization of Web Information
- Machine Learning: Theory and Methods
- Statistical Relational Learning
- Advanced Machine Learning
- Decision Analysis and Game Theory
- Program Analysis

## Programming Skills

Python, C++, C, Java, C#, Matlab, R,  $\LaTeX$ , HTML, Bash, SQL, JavaScript

## References

Thorsten Joachims

- Professor, Dept. of Computer Science
- Cornell University
- email: [tj@cs.cornell.edu](mailto:tj@cs.cornell.edu)

Robert Kleinberg

- Professor, Dept. of Computer Science
- Cornell University
- email: [rdk@cs.cornell.edu](mailto:rdk@cs.cornell.edu)

Miroslav Dudík

- Senior Researcher
- Microsoft Research, NYC
- email: [mdudik@microsoft.com](mailto:mdudik@microsoft.com)

David Grangier

- Research Scientist
- Facebook AI Research, Menlo Park
- email: [david@grangier.info](mailto:david@grangier.info)

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Last updated: March 28, 2017 • <http://www.cs.cornell.edu/~adith/CV.pdf>