

Zhengyu Yin

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Education

Ph.D. Computer Science, University of Southern California, 2013(*expected*).

Advisor: Milind Tambe,

B.E. Computer Science and Technology, Tsinghua University, 2008.

Honor: Excellent Graduate (3/160)

Research Fields

Computational Game Theory, Game theory for Security, Optimization, Decentralized Constraint Reasoning, Decentralized Sequential Decision Making

Academic and Professional Experience

FACEBOOK, ADS OPTIMIZATION

Software Development Engineer Intern, Summer 2012.

- *Implemented an offline analysis tool for ad auctions in the right-hand side column. Analyzed large-scale ad auction data on hive/hadoop infrastructure.*
- *Rewrote the entire VCG auction selection code with a novel algorithm combining heuristic search and bipartite max-weight matching, resulting in a 8 to 10-fold speedup over the previous implementation.*

UNIVERSITY OF SOUTHERN CALIFORNIA, DEPARTMENT OF COMPUTER SCIENCE

Research Assistant, Milind Tambe, Fall 2008 - present.

- *focus on game-theoretic modeling and robust solution techniques for real-world security applications. Develop algorithms to find optimal strategies for Stackelberg games with uncertainties such as execution error, observation noise, and preference uncertainty.*

Teaching Assistant, Spring 2010.

- *CSCI 543: Software Multiagent Systems, Milind Tambe*

Teaching Experience, delivered multiple lectures, Spring 2011.

- *CSCI 543: Software Multiagent Systems, Milind Tambe*

TSINGHUA UNIVERSITY, DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

Research Assistant, Bin Liu Fall 2006–Fall 2007.

Honors & Awards

SCHOLARSHIPS

First-Class Scholarship of Tsinghua University, Tsinghua University, 2005.

IBM Excellent Student Scholarship, Tsinghua University, 2006.

National Scholarship, Tsinghua University, 2007.

AWARDS

Best Research Assistant, University of Southern California, 2012.

Excellent Graduate in Department of Computer Science and Technology, Tsinghua University, 2008.

Publications

JOURNAL ARTICLES

1. Zhengyu Yin, Albert Xin Jiang and Milind Tambe, Christopher Kiekintveld, Kevin Leyton-Brown, Tuomas Sandholm, and John P. Sullivan: **TRUSTS: Scheduling Randomized Patrols for Fare Inspection in Transit Systems using Game Theory** *AI Magazine*, 33(4):59-72, 2012.
2. Dmytro Korzhyk*, Zhengyu Yin*, Christopher Kiekintveld, Vincent Conitzer, and Milind Tambe (*Korzhyk and Yin are both first-authors of this publication): **Stackelberg vs. Nash in Security Games: An Extended Investigation of Interchangeability, Equivalence, and Uniqueness** *Journal of Artificial Intelligence Research*, 41:297-327, 2010.

FULL CONFERENCE PAPERS

3. Albert Xin Jiang*, Zhengyu Yin*, Chao Zhang, Milind Tambe, and Sarit Kraus (*Jiang and Yin are both first-authors of this publication): **Game-theoretic Randomization for Security Patrolling with Dynamic Execution Uncertainty** (To Appear) In Proceedings of Twelfth International Conference on Autonomous Agents and Multiagent Systems (AAMAS), Saint Paul, USA, June, 2013.
4. Zhengyu Yin, Albert Xin Jiang, Matthew P. Johnson, Milind Tambe, Christopher Kiekintveld, Kevin Leyton-Brown, Tuomas Sandholm, and John P. Sullivan: **TRUSTS: Scheduling Randomized Patrols for Fare Inspection in Transit Systems** In Proceedings of Twenty-Fourth Conference on Innovative Applications of Artificial Intelligence (IAAI), Toronto, Canada, July, 2012.
5. Zhengyu Yin and Milind Tambe: **A Unified Method for Handling Discrete and Continuous Uncertainty in Bayesian Stackelberg Games** In Proceedings of Eleventh International Conference on Autonomous Agents and Multiagent Systems (AAMAS), Valencia, Spain, June, 2012.
6. Ondrej Vanek, Zhengyu Yin, Manish Jain, Branislav Bosansky, Michal Pechoucek, and Milind Tambe: **Game-theoretic Resource Allocation for Malicious Packet Detection in Computer Networks** In Proceedings of Eleventh International Conference on Autonomous Agents and Multiagent Systems (AAMAS), Valencia, Spain, June, 2012.
7. Zhengyu Yin, Manish Jain, Fernando Ordonez and Milind Tambe: **Risk-Averse Strategies for Security Games with Execution and Observational Uncertainty** In Proceedings of Twenty-Fifth Conference on Artificial Intelligence (AAAI), San Francisco, USA, August, 2011.

8. Zhengyu Yin and Milind Tambe: **Continuous Time Planning for Multiagent Teams with Temporal Constraints** In Proceedings of Twenty-Second International Joint Conference on Artificial Intelligence (IJCAI), Barcelona, Spain, July, 2011.
9. Meritxell Vinyals, Eric Shieh, Jesus Cerquides, Juan Antonio Rodriguez-Aguilar, Zhengyu Yin, Milind Tambe, and Emma Bowring: **Quality Guarantees for Region Optimal DCOP Algorithms** In Proceedings of the Tenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS), Taipei, Taiwan, May, 2011.
10. Rong Yang, Manish Jain, James Pita, Zhengyu Yin, Jun-Young Kwak, Milind Tambe: **Game theory and human behavior: Challenges in security and sustainability** In Proceedings of the Second International Conference on Algorithmic Decision Theory (ADT), October 2011.
11. Jason Tsai, Zhengyu Yin, Jun-young Kwak, David Kempe, Christopher Kiekintveld, and Milind Tambe: **Urban Security: Game-Theoretic Resource Allocation in Networked Physical Domains** In Proceedings of the National Conference on Artificial Intelligence (AAAI), Atlanta, USA, July 2010.
12. Zhengyu Yin*, Dmytro Korzhuk*, Christopher Kiekintveld, Vincent Conitzer, and Milind Tambe (*Korzhuk and Yin are both first-authors of this publication): **Stackelberg vs. Nash in Security Games: Interchangeability, Equivalence, and Uniqueness** In Proceedings of the Ninth International Conference on Autonomous Agents and Multiagent Systems, Toronto, Canada, May 2010.
13. Christopher Kiekintveld, Zhengyu Yin, Atul Kumar and Milind Tambe: **Asynchronous Algorithms for Approximate Distributed Constraint Optimization with Quality Bounds** In Proceedings of the Ninth International Conference on Autonomous Agents and Multiagent Systems, Toronto, Canada, May 2010.
14. Emma Bowring, Zhengyu Yin, Rob Zinkov, Milind Tambe: **Sensitivity analysis for distributed optimization with resource constraints** In Proceedings of the Eighth International Conference on Autonomous Agents and Multiagent Systems, Budapest, Hungary, May 2009.

SHORT CONFERENCE PAPERS

15. Jun-Young Kwak, Rong Yang, Zhengyu Yin, Matthew E. Taylor, and Milind Tambe: **Towards Addressing Model Uncertainty: Robust Execution-time Coordination for Teamwork (Extended Abstract)** In Proceedings of the 2011 IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT), Lyon, France, 2011.
16. Jun-young Kwak, Rong Yang, Zhengyu Yin, Matthew E. Taylor, and Milind Tambe: **Teamwork in Distributed POMDPs: Execution-time Coordination Under Model Uncertainty (Extended Abstract)** In Proceedings of the Tenth International Conference on Autonomous Agents and Multiagent Systems (AAMAS), Taipei, Taiwan, May 2011.
17. Jason Tsai, Zhengyu Yin, Jun-young Kwak, David Kempe, Christopher Kiekintveld, and Milind Tambe: **How to Protect a City: Strategic Security Placement in Graph-Based Domains (Extended Abstract)** In Proceedings of the Ninth International Conference on Autonomous Agents and Multiagent Systems, Toronto, Canada, May 2010.

DEMO PAPERS

18. Michal Jakob, Zbyněk Moler, Antonín Komenda, Zhengyu Yin, Albert Xin Jiang, Matthew P. Johnson, Michal Pěchouček, and Milind Tambe: **AgentPolis: Towards a Platform for Fully Agent-based**

Modeling of Multi-Modal Transportation (Demonstration) (To appear) In Proceedings of the Eleventh International Conference on Autonomous Agents and Multiagent Systems (AAMAS), Valencia, Spain, June 2012.

SYMPOSIUM AND WORKSHOP PAPERS

19. Albert Xin Jiang, Zhengyu Yin, Matthew P. Johnson, Christopher Kiekintveld, Kevin Leyton-Brown, Tuomas Sandholm, and Milind Tambe: **Towards Optimal Patrol Strategies for Fare Inspection in Transit Systems** In AAAI Spring Symposium on Game Theory for Security, Sustainability and Health, Palo Alto, USA, March, 2012
20. Zhengyu Yin, Kanna Rajan, and Milind Tambe: **Solving Continuous-Time Transition-Independent DEC-MDP with Temporal Constraints** In AAMAS Workshop on Multiagent Sequential Decision Making in Uncertain Domains (MSDM), Taipei, Taiwan, May, 2011.
21. Jun-young Kwak, Rong Yang, Zhengyu Yin, Matthew E. Taylor, and Milind Tambe: **Robust Execution-time Coordination in DEC-POMDPs Under Model Uncertainty** In AAMAS Workshop on Multiagent Sequential Decision Making in Uncertain Domains (MSDM), Taipei, Taiwan, May, 2011.
22. Jun-young Kwak, Rong Yang, Zhengyu Yin, Matthew E. Taylor, and Milind Tambe: **Teamwork and Coordination under Model Uncertainty in DEC-POMDPs** In AAAI Workshop on Interactive Decision Theory and Game Theory (IDTGT), July, 2010
23. Jason Tsai, Zhengyu Yin, Jun-young Kwak, David Kempe, Christopher Kiekintveld, and Milind Tambe: **Strategic Security Placement in Network Domains with Applications to Transit Security** In IJCAI 2009 Workshop on Quantitative Risk Analysis for Security Applications, Pasadena, USA, July 2009.
24. Zhengyu Yin, Christopher Kiekintveld, Atul Kumar, and Milind Tambe: **Local Optimal Solutions for DCOP: New Criteria, Bound, and Algorithm** In AAMAS 2009 Workshop on Optimization in Multi-Agent Systems, Budapest, Hungary, May 2009.
25. Lei Shi, Bin Liu, Changhua Sun, Zhengyu Yin, Laxmi Bhuyan, H. Jonathan Chao: **Flow-slice: a novel load-balancing scheme for multi-path switching systems** In Symposium on Architectures for Networking and Communications Systems, Orlando, USA, December 2007.

BOOK CHAPTER

Milind Tambe, Jun-young Kwak, Matthew Taylor, Manish Jain, Chris Kiekintveld, Zhengyu Yin, Rong Yang: **Two Decades of Multiagent Teamwork Research: Past, Present, Future** Book chapter in Proceedings of the Second International Workshop on Collaborative Agents – Research and Development (CARE), 2010.

REPRINTED PAPERS IN EDITED VOLUMES

Zhengyu Yin*, Dmytro Korzhyk*, Christopher Kiekintveld, Vincent Conitzer, and Milind Tambe (*Korzhyk and Yin are both first-authors of this publication): **Stackelberg vs. Nash in Security Games: Interchangeability, Equivalence, and Uniqueness** In Security and Game Theory: Algorithms, Deployed Systems, Lessons Learned (Edited by Milind Tambe), Cambridge University Press, 2011.

Presentations

Risk-Averse Strategies for Security Games with Execution and Observational Uncertainty
- San Francisco, USA, August, 2011.

Continuous Time Planning for Multiagent Teams with Temporal Constraints
- IJCAI, Barcelona, Spain, July, 2011.

Solving Continuous-Time Transition-Independent DEC-MDP with Temporal Constraints
- MSDM (AAMAS), Taipei, Taiwan, May, 2011.

Stackelberg vs. Nash in Security Games: Interchangeability, Equivalence, and Uniqueness
- AAMAS, Toronto, Canada, May, 2010.

Local Optimal Solutions for DCOP: New Criteria, Bound, and Algorithm
- OptMAS (AAMAS), Budapest, Hungary, May, 2009.

Professional Activities

Co-organizer of the tutorial on **Game theory for Security**. To appear at the International Conference on Autonomous Agents and Multiagent Systems (AAMAS), June 2012.

Dissertation Proposal

Title: Addressing Uncertainty in Stackelberg Games for Security: Models and Algorithms

Committee Members

Dr. Milind Tambe (chair)

Professor of Computer Science and Professor of Industrial and Systems Engineering, University of Southern California.

Dr. Fernando Ordóñez

Associate Professor of Industrial and Systems Engineering and Associate Professor of Computer Science, University of Southern California. Associate Professor of Industrial Engineering Department, University of Chile at Santiago.

Dr. Tuomas W. Sandholm

Professor of Computer Science and Machine Learning, Carnegie Mellon University.

Dr. Bhaskar Krishnamachari

Associate Professor of Electrical Engineering and Associate Professor of Computer Science, University of Southern California.

Dr. Rajiv Maheswaran

Research Assistant Professor of Computer Science, University of Southern California. Research Scientist, Information Sciences Institute at the USC Viterbi School of Engineering.

Dr. Matthew McCubbins (outside member)

Provost Professor of Law, Business and Political Economy, University of Southern California.

Miscellaneous

COMPUTER SKILLS

C/C++, Java, Python, Matlab, Hive/Hadoop, SQL, L^AT_EX, Linux.

Last updated: February 7, 2013
<http://teamcore.usc.edu/zhengyu/cv.pdf>