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## Education

**8/86-5/91** PhD, School of Computer Science, Carnegie Mellon University, Pittsburgh, PA 15213.

Thesis title: *Eliminating combinatorics from production match.*

Thesis advisors: *Prof. Allen Newell and Prof. Paul Rosenbloom*

**7/82-6/86** M. Sc.(tech) Computer Science: Birla Institute of Technology and Science(BITS), Pilani, India.

## Current Positions at University of Southern California (USC)

**8/16-** Founding Co-director CAIS Center for AI in Society

**8/12-** Helen N. and Emmett H. Jones Professor in Engineering

**8/17-** Director of MURI on Cyber-security and Game Theory

**3/10-** Professor, Daniel J. Epstein Department of Industrial and Systems Engineering Department

**10/06-** Professor, Computer Science Department

## Current Positions at Avata Intelligence (formerly ARMORWAY Inc.)

**1/13-** Co-Founder, Member of Board of Directors and Director of Research

## Experience

**8/11-8/16** Director of MURI on Game Theory and Human Behavior

**9/01-9/06** Associate Professor, Computer Science Department, University of Southern California (USC)

**5/98-5/03** Project Leader, Information Sciences Institute (ISI), University of Southern California (USC)

**3/00-9/01** Research Associate Professor, Computer Science Department, University of Southern California

**2/94-3/00** Research Assistant Professor, Computer Science Department, University of Southern California

**9/93-5/98** Computer Scientist, Information Sciences Institute, University of Southern California

**7/91 - 8/93** Research Associate, School of Computer Science, Carnegie Mellon University.

**1/86 - 6/86** Computer Maintenance Corporation, Bombay, India, under the practice school program of BITS, Pilani.

**5/84 - 7/84** Computer division, Bhabha Atomic Research Center, Bombay, India under the practice school program of BITS, Pilani.

## **Awards: Research, Teaching, Service and Others**

### **Research: Honors and Awards in Computer Science**

- 2019** *AAAI 2019 Robert S. Englemore Memorial Lecture Award* The AAAI Robert S. Englemore Memorial Lecture Award is given to people who have demonstrated excellence in scholarship in AI, outstanding applications of AI, as well as extraordinary service to AAAI and the AI community. Dr Tambe is being honored in particular for outstanding research contributions in the area of multi-agent systems and their application to problems of societal significance.
- 2018** *IJCAI 2018 John McCarthy Award* The IJCAI John McCarthy Award is intended to recognize established mid-career researchers that have built up a major track record of research excellence in artificial intelligence. From the award text: “Professor Tambe is recognized for research and development of important practical applications of AI and multi-agent systems for social good.”
- 2013** *ACM Fellow* Fellow of the Association for Computing Machinery “For contributions to the theory and practice of multi-agent systems, teamwork and security games.”
- 2007** *AAAI Fellow* Fellow of the Association for the Advancement of Artificial Intelligence “For significant contributions to theory and software infrastructure for multi-agent systems and pioneering applications in teamwork systems.”
- 2005** *ACM/SIGART Autonomous Agents Research Award* An annual award for excellence in research in the area of autonomous agents. From the award text “Dr. Tambe made seminal contributions to the theory, applications, and software infrastructure in the area of teamwork, which has become a flourishing research area in multi agent systems”.

### **Research: Honors and Awards in Operations Research**

- 2012** *Daniel H. Wagner Prize for Excellence in Operations Research Practice, INFORMS* Awarded at the annual meeting of the INFORMS Operations Research society, the Wagner Prize recognizes excellence in Operations Research practice. Our paper entitled “A Deployed Quantal Response Based Patrol Planning System for the US Coast Guard” won this competition for 2012.
- 2011** *Rist Prize, Military Operations Research Society* The RIST prize recognizes the practical benefits of sound Operations Research. We received the award for “Software Assistants for Patrol Planning at LAX, Federal Air Marshals Service, and Transportation Security Administration”.

### **Research: Honors and Awards in Homeland Security**

- 2010** *Christopher Columbus Fellowship Foundation Homeland Security Award* The Foundation is a Federal government agency established by US Congress to “encourage and support research, study and labor designed to produce new discoveries in all fields of endeavor for the benefit of mankind.” The award ceremony took place at Mansfield room, US Capitol.

### **Research: Awards and Recognition from Security Agencies for Real-world Impact**

- 2013** *Meritorious Team Commendation from Commandant of the US Coast Guard* for creating “an innovative approach to optimize patrol schedules and actions for the Coast Guard Ports, Waterways and

Coast Security missions” while serving the Coast Guard Port Resilience for Operational/Tactical Enforcement to Combat Terrorism (PROTECT) Team.

- 2011** *Certificate of Appreciation From the Transportation Security Administration, Federal Air Marshals Service (FAMS)* “in recognition and appreciation of your outstanding achievement in developing the Intelligent Randomization in Scheduling (IRIS) program” to advance the mission of the Office of Law Enforcement/FAMS.
- 2011** *Operational Excellence Award from the Commander, First Coast Guard District* for work on the PROTECT scheduling software to intelligently randomize boat patrols of critical infrastructure around Boston Harbor.
- 2009** *Commendation, City of Los Angeles, Los Angeles World Airports Police Department* As a leader of my research team from CREATE (Center for Risk and Economic Analysis of Terrorism Events) that developed ARMOR, “Assistant for randomized monitoring over routes”. The commendation states “To merit this commendation you have performed an exceptional service to the Airport police Division, the Los Angeles World Airports and the city of Los Angeles. Your outstanding service facilitates the critical link between the laboratory and the operational world.”
- 2009** *Certificate of Recognition, DHS University Programs* Received by CREATE “The DHS Office of University Programs recognizes CREATE for the outstanding contributions to the security of our nation that the Assistant for Randomized Monitoring over Routes (ARMOR) has made to the police operations at the Los Angeles World Airports”.

### **Research: Other Key Awards and Recognition**

- 2015** *Orange County Engineering Council Outstanding Project Achievement Award* for our project completed with the LA Sheriff’s Department on “Game Theory Metro: Game theoretic scheduling of Metro security patrols”
- 2012** *IBM Faculty Award* for research on “Towards smarter government and smarter cities: Computational game theory for public safety and welfare”.
- 2003** *The Okawa Foundation Research award* for research on “Agents and Multiagent Systems”.
- 1999** *RoboCup’99 Scientific Challenge Award* for outstanding research at a RoboCup (International Robotic Soccer) Tournament. Led the USC effort.

### **Research: Top Tech lists**

- 2018** *Listed in “Top Tech 2018” by IEEE Spectrum* for our work on PAWS: Protection Assistant for Wildlife Security
- 2015** *Listed in “26 incredible innovations that improved the world in 2015” by Mashable.com* for our work on “How an algorithm can help spread HIV information among homeless teens”.

### Research: Major Awards at USC

- 2014** *USC Associates Award for Creativity in Research* These are the highest honors the university faculty can bestow on its members for distinguished intellectual and artistic achievements.
- 2009** *Inaugural USC Viterbi School of Engineering Use-inspired research award* Award recognizes significant work in four key areas — scientific understanding, technical knowledge, research promise and societal needs — that has culminated in a demonstrably useful contribution to a problem of national/societal importance.

### Research: Influential Paper, Best Paper, Best Student Paper, Best Application Paper or Video Awards

- 2017** *Best Video, AAAI Conference on Artificial Intelligence*. Video title: “HEALER: Using AI to Raise HIV Awareness among Homeless Youth”.
- 2017** *Best Student Video, AAAI Conference on Artificial Intelligence*. Video title: “HEALER: Using AI to Raise HIV Awareness among Homeless Youth”.
- 2016** “Pragnesh Jay Modi” *Best Student Paper, International Conference on Agents and Multiagent Systems 2016 (AAMAS’2016)* Paper Title: “Using Social Networks to Aid Homeless Shelters: Dynamic Influence Maximization Under Uncertainty” (first author: Amulya Yadav, PhD student).
- 2016** *Most visionary paper, IDEAS workshop at International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2016)*: Paper title: “POMDPs for Assisting Homeless Shelters - Computational and Deployment Challenges”
- 2016** *Deployed application award, Innovative Applications of Artificial Intelligence (IAAI) 2016*: Paper Title: “Deploying PAWS: Field Optimization of the Protection Assistant for Wildlife Security”.
- 2016** *Best Application Video, AAAI Conference on Artificial Intelligence (AAAI 2016)*: Video Title: “Save the Wildlife, Save the Planet: Protection Assistant for Wildlife Security (PAWS)”.
- 2015** *Outstanding paper, International Joint Conference on Artificial Intelligence (IJCAI 2015), Computational Sustainability track*: Paper Title: “When Security Games Go Green: Designing Defender Strategies to Prevent Poaching and Illegal Fishing”.
- 2012** *IFAAMAS Award for Influential Paper in Autonomous Agents and Multiagent Systems* (Given at least 10 years after the date of publication of the paper) From the International Foundation for Agents and Multiagent Systems for my paper “Towards Flexible Teamwork” published in JAIR 1997.
- 2012** *Best paper, International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2012) Innovative Applications track*: Paper Title: “PROTECT: A Deployed Game Theoretic System to Protect the Ports of the United States”.
- 2011** *Best paper, International Conference of Intelligent Virtual Agents (IVA 2011)*: Paper Title: “Empirical Evaluation of Computational Emotional Contagion Models”.
- 2011** *Best paper, International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2011) Innovative Applications track*: Paper Title: “GUARDS - Game Theoretic Security Allocation on a National Scale”.

- 2010** *Student Merit Award, Security and Defense, Society for Risk Analysis (SRA) meeting*: Poster Title: “Research allocation decisions against adaptive adversaries”. (first author: James Pita, PhD student).
- 2009** *Best paper, International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2009), Industry Track*: Paper Title: “IRIS — A Tool for Strategic Security Allocation in Transportation Networks”.
- 2009** *Best Student Poster, DHS Third Annual University Network Summit* Poster Title: “Strategic allocation of Federal Air Marshals”. (first author: Jason Tsai, PhD student).
- 2008** *Best paper, International Symposium on Collaborative Technologies and Systems (CTS 2008)*: Paper Title: “Multiagent Adjustable Autonomy Framework (MAAF) for multirobot multihuman teams”.
- 2007** *Best paper, International workshop on Distributed constraint reasoning (DCR 2007)*: Paper Title: “Lower bounds on the quality of k-optimal DCOP solutions with respect to the global optimum”.
- 2005** *Best paper, International Workshop on Safety and Security in Multiagent Systems (SASEMAS’2005)*: Paper Title: “Safety in multiagent systems via policy randomization”.
- 2002** *Best paper, International Joint Conference on Autonomous Agents and Multiagents (AAMAS’02)*: Paper Title: “Multiagent teamwork: Analyzing the complexity and optimality of key theories and models”.
- 1999** *Best of International Conference on Autonomous Agents 1999 (Agents’99)*: Paper published in the “Best of Agents’99” special issue of the Autonomous Agents and Multi-agent Systems Journal. Paper Title: “On being a teammate: Experiences acquired in the design of RoboCup teams”.
- 1999** *Best of International Conference on Multi-Agent Systems 1998 (ICMAS’98)*: Paper published in the “Best of ICMAS’98” special issue of the Autonomous Agents and Multi-agent Systems Journal. Title: “Towards flexible teamwork in persistent teams”.

### **Research: Best Paper Finalist, Video Award Finalist**

- 2018** *Finalist for Best Student paper, International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2018)*: Paper Title: “End to End Influence Maximization in the Field”. (first author: Bryan Wilder, PhD student)
- 2017** *Finalist for Best paper, International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2017)*: Paper Title: “Influence Maximization in the Field: The Arduous Journey from Emerging to Deployed Applications”.
- 2016** *Finalist for Best Student Video, AAAI Conference on Artificial Intelligence*. Video title: “PAWS: Protection Assistant for Wildlife Security”. (first author: Fei Fang, PhD Student)
- 2013** *Finalist for Best paper, International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2013)*: Paper Title: “Game-theoretic Randomization for Security Patrolling with Dynamic Execution Uncertainty”.
- 2013** *Finalist for Best Student Poster, Conference on Validating Models of Adversary Behavior*. Poster Title: “Optimal Patrol Strategy for Protecting Moving Targets with Multiple Mobile Resources”. (first author: Fei Fang, PhD student).

- 2010** *Finalist for EURO Operations Research Conference Excellence in Practice Award EEPA'2010* Our paper from the journal "Interfaces" selected to be a finalist for the EEPA'2010 award. Title: "Software Assistants for Randomized Patrol Planning for The LAX Airport Police and The Federal Air Marshals Service."
- 2008** *Finalist for Best paper, International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2008), Industry track:* Paper Title: "Deployed ARMOR protection: The Application of a Game Theoretic Model for Security at the Los Angeles International Airport".
- 2005** *Finalist for Best Paper, Central and Eastern European Conference on Agents and Multiagent Systems 2005 (CEEMAS'2005):* Paper Title: "On Communication in Solving Distributed Constraint Satisfaction problems".
- 2003** *Finalist for Best Student Paper, International Joint Conference on Agents and Multiagent Systems 2003 (AAMAS'2003)* Paper Title: "An asynchronous complete method for distributed constraint optimization" (first author: Pragnesh Jay Modi, PhD student).

### **Implemented Agent Team Competitions: Awards for Fielded Agents and Agent Teams**

- 2001** *Sliver medal* at the Robocup-Rescue International Competition at RoboFesta, International Robotic Games Festival, held in Japan, in July 2001, for development of earthquake rescue agent-teams. Led the USC effort that won this prize.
- 2001** *Third Place Prize* at RoboCup'2001 International Robotic Soccer and Rescue tournaments, held in conjunction with the International Joint Conference on Artificial Intelligence, 2001, for development of earthquake rescue agent teams. Led the USC effort that won this prize.
- 1997** *Third-place prize*, RoboCup'97 International Robotic Soccer Competition (simulation league), held in conjunction with the International Joint Conferences on Artificial Intelligence, 1997. Led the USC student team; software developed was based on my research in multi-agent teams.

### **Teaching and Mentoring: Key Awards**

- 2010** *Steven B. Sample Teaching and Mentoring Award* This award is a signature program of the USC Parents Association and is the only faculty recognition award that is initiated by USC parents and family members.

### **Teaching and Mentoring: Best PhD thesis and Best RA awards won by students**

- 2017** *William F. Ballhaus, JR. Prize for Graduate Engineering Research* for Fei Fang for best PhD thesis in The USC Viterbi School of Engineering
- 2017** *Best PhD Thesis Award, Computer Science, University of Southern California* for Fei Fang for her PhD work
- 2017** *IFAAMAS Victor Lesser Distinguished Doctoral Dissertation Runner Up* at the International Conference on Autonomous Agents and Multiagent Systems (AAMAS) for Fei Fang for her PhD work



- 2016** *Best PhD Thesis Award, Computer Science, University of Southern California* for Leandro Marcolino for his PhD work
- 2013** *IFAAMAS Victor Lesser Distinguished Doctoral Dissertation Award* at the International Conference on Autonomous Agents and Multiagent Systems (AAMAS) for Manish Jain for his PhD work
- 2013** *Best PhD Thesis Award, Computer Science, University of Southern California* for Manish Jain for his PhD work
- 2005-** *Best research assistant awards* Amulya Yadav (2017), Haifeng Xu (2017), Fei Fang (2016), Leandro Marcolino (2015), Rong Yang (2014), Zhengyu Yin (2013), Manish Jain (2012), Jonathan Pearce (2006), Pradeep Varakantham (2005).

### Key Service Awards

- 2004** *ACM Recognition of Service Award* In Appreciation of Contributions to ACM (Association for Computing Machinery) as General Co-Chair for AAMAS'2004: The Third International Joint Conference on Autonomous Agents and Multiagent Systems.
- 1997** *Meritorious service award* of the USC/Information Sciences Institute for outstanding contributions to the success of ISI's robots in international competition.

### Other Honors and Awards

- 1986** *Bhamsa award* for the highest cumulative grade point average (CGPA) of 9.96/10.0 in the computer science department of BITS, Pilani.
- 1986** *Bronze medal* for the third highest overall cumulative grade point average (CGPA) of 9.96/10.0 at BITS, Pilani.
- 1982** *Merit list* (ranked 7th) in the higher secondary certificate examination, state of Maharashtra (Pune division), India.
- 1982** First in the subject of electronics in the higher secondary certificate examination, state of Maharashtra (Pune division), India.

### Professional Memberships

- Association for Advancement of Artificial Intelligence [Formerly, American Association for AI] (AAAI)
- Association for Computing Machinery (ACM)
- Institute for Operations Research and Management Sciences (INFORMS)

## Publications

### Book Series

[BookSeries1] M. Tambe and E. Rice (Co-Editors in Chief) *Artificial Intelligence and Social Good* Cambridge University Press, 2018

### Books, Collected Papers, Edited Books

[B11] F. Fang, M. Tambe, B. Dilkina, A. Plumptre *Artificial Intelligence and Conservation* (Part of the “AI and Social Good” book series) Cambridge University Press, 2018

[B10] M. Tambe, E. Rice *Artificial Intelligence and Social Work* (Part of the “AI and Social Good” book series) Cambridge University Press, 2018

[B9] A. Abbas, M. Tambe, D. Von Winterfeldt *Improving Homeland Security Decisions* Cambridge University Press, 2017

[B8] Q. Zhu, T. Alpcan, M. Panaousis, M. Tambe, W. Casey *Conference on Decision and Game Theory for Security (GameSec)* Springer, 2016

[B7] M. Tambe *Security and Game Theory: Algorithms, Deployed Systems, Lessons Learned* Cambridge University Press, 2011

[B6] P. Paruchuri, J.P. Pearce, M. Tambe, F. Ordonez, S. Kraus *Keep the adversary guessing: Agent security by policy randomization* VDM Verlag, 2008

[B5] N. Jennings, C. Sierra, L. Sonnenberg, M. Tambe *Third International Joint Conference on Agents and Multiagent Systems* IEEE Computer Society, 2004.

[B4] V. Lesser, C. Ortiz and M. Tambe *Distributed sensor networks: A multiagent perspective* Kluwer Academic Publishers, 2003.

[B3] J.J. Meyer and M. Tambe *Intelligent Agents, Volume VIII: Lecture notes in Artificial Intelligence 2333*. Springer Publishers, 2002.

[B2] A. Drogoul, T. Fukuda and M. Tambe. *Collective Robotics Workshop: Lecture notes in Artificial Intelligence 1456*. Springer Publishers, 1998.

[B1] M. Wooldridge, J. Muller, and M. Tambe. *Intelligent Agents, Volume II: Lecture notes in Artificial Intelligence 1037*. Springer Publishers, 1996.

### Rigourously Refereed Journal Articles

[J51] E.Rice, B. Wilder, R. Petering, J. Craddock, A. Yoshioka-Maxwell, M. Hemler, L. Onasch-Vera, A. Yadav, M. Tambe, D. Woo *Piloting the Use of Artificial Intelligence to Enhance HIV Prevention Interventions for Youth Experiencing Homelessness* In *Journal of the Society for Social Work and Research (JSSWR)*, (to appear)

- [J50] E. Rice, M. Holguin, H. Hsu, M. Morton, P. Vayanos, M. Tambe, H. Chan Linking Homelessness Vulnerability Assessments to Housing Placements and Outcomes for Youth In *Cityscape: A Journal of Policy Development and Research*, 20(3):69-86, 2018.
- [J49] L.S. Marcolino, A.S. Lakshminarayana, V. Nagarajan, M. Tambe Every Team Deserves a Second Chance: An Extended Study on Predicting Team Performance In *Journal of Agents and Multiagent Systems (JAAMAS)*, 31(5):1003-1051, 2017.
- [J48] D. Kar, F. Fang, F.M. Delle Fave, N. Sintov, M. Tambe, A. Lyet Comparing Human Behavior Models in Repeated Stackelberg Security Games: An Extended Study In *Artificial Intelligence Journal (AIJ)*, 240:65-103, 2016.
- [J47] C. Zhang, S. Gholami, D. Kar, A. Sinha, M. Jain, R. Goyal, M. Tambe Keeping Pace with Criminals: An Extended Study of Designing Patrol Allocation Against Adaptive Opportunistic Criminals In *Games*, 7(3), 15, 2016; DOI: <http://dx.doi.org/10.3390/g7030015>.
- [J46] E. Shieh, A. Jiang, A. Yadav, P. Varakantham, M. Tambe An Extended Study on Addressing Defender Teamwork while Accounting for Uncertainty in Attacker Defender Games using Iterative Dec-MDPs In *Multi-Agent and Grid Systems*, 11(4):189-226, 2016.
- [J45] A. Sinha, T. Nguyen, D. Kar, M. Brown, M. Tambe, A. Jiang From Physical Security to Cyber Security In *Journal of Cybersecurity*, 1(1):19-35, 2015; DOI: <http://dx.doi.org/10.1093/cybsec/tyv007>.
- [J44] F.M. Delle Fave\*, E. Shieh\*, M. Jain, A. Jiang, H. Rosoff, M. Tambe, J. Sullivan (\* Both Delle Fave and Shieh are first authors of this article.) Efficient Solutions for Joint Activity Based Security Games: Fast Algorithms, Results and a Field Experiment on a Transit System In *Journal of Autonomous Agents and Multiagent Systems (JAAMAS)*, 29(5):787-820, 2015.
- [J43] F.M. Delle Fave\*, A. Jiang\*, Z. Yin, C. Zhang, M. Tambe, S. Kraus, J. Sullivan (\* Both Delle Fave and Jiang are first authors of this article.) Game-theoretic Security Patrolling with Dynamic Execution Uncertainty and a Case Study on a Real Transit System In *Journal of Artificial Intelligence Research (JAIR)*, 50:321-367, 2014.
- [J42] A. Jiang, M. Jain, M. Tambe Computational Game Theory for Security and Sustainability In *Journal of Information Processing (JIP)*, (**Invited article**), 22(2):176-185, 2014.
- [J41] J. Tsai, T. Nguyen, N. Weller, M. Tambe Game-Theoretic Target Selection in Contagion-based Domains In *The Computer Journal*, 57(6): 893-905, 2014.
- [J40] J. Kwak, P. Varakantham, R. Maheswaran, Y. Chang, M. Tambe, B. Becerik-Gerber, W. Wood TESLA: An Extended Study of an Energy-saving Agent that Leverages Schedule Flexibility In *Journal of Autonomous Agents and Multiagent Systems (JAAMAS)*, 28(4):605-636, 2014.
- [J39] M. Brown, B. An, C. Kiekintveld, F. Ordonez, M. Tambe An Extended Study on Multi-Objective Security Games *Journal of Autonomous Agents and Multiagent Systems (JAAMAS)*, 28(1):31-71, 2014.
- [J38] F. Fang, A. Jiang, M. Tambe Protecting Moving Targets with Multiple Mobile Resources In *Journal of Artificial Intelligence Research (JAIR)*, 48:583-634, 2013.

- [J37] B. An, E. Shieh, R. Yang, M. Tambe, C. Baldwin, J. DiRenzo, B. Maule, G. Meyer A Deployed Quantal Response Based Patrol Planning System for the US Coast Guard In *Interfaces*, 43(5):400-420, 2013.
- [J36] J. Tsai, Y. Qian, M. Tambe, Y. Vorobeychik, C. Kiekintveld Bayesian Security Games for Controlling Contagion (Extended version) *ASE Human Journal*, 2:168-181, 2013.
- [J35] R. Yang, C. Kiekintveld, F. Ordonez, M. Tambe, R. John Improving Resource Allocation Strategies Against Human Adversaries in Security Games: An Extended Study In *Artificial Intelligence Journal (AIJ)*, 195:440-469, 2013.
- [J34] J. Tsai, E. Bowring, S. Marsella, M. Tambe Empirical Evaluation of Computational Emotional Contagion Model In *Journal of Autonomous Agents and Multiagent Systems (JAAMAS)*, 27(2):200-217, 2013.
- [J33] M. Vieira, R. Govindan, G. Sukhatme, M. E. Taylor, M. Jain, P. Tandon, M. Tambe Mitigating Multi-path Fading in a Mobile Mesh Network *Ad-hoc Networks Journal*, 11(4):1510-1521, 2013.
- [J32] L. Klein, J. Kwak, G. Kavulya, F. Jazizadeh, B. Becerik-Gerber, P. Varakantham, M. Tambe Coordinating Occupant Behavior for Building Energy and Comfort Management using Multi-Agent Systems *Automation in Construction*, 1:525-536, 2012.
- [J31] D. Korzhyk\*, Z. Yin\*, C. Kiekintveld, V. Conitzer, M. 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 (JAIR)*, 41:297-327, 2011.
- [J30] M. E. Taylor, M. Jain, P. Tandon, M. Tambe, M. Yokoo Distributed On-line Multi-Agent Optimization Under Uncertainty: Balancing Exploration and Exploitation *Advances in Complex Systems*, 14(3):471-528, 2011.
- [J29] B. Kaluza, E. Dovgana, T. Tusara, M. Tambe, M. Gams A Probabilistic Risk Analysis for Multimodal Entry Control *Expert Systems with Applications*, 38:6696-6704, 2011.
- [J28] J. Pita, M. Jain, F. Ordonez, M. Tambe, S. Kraus Solving Stackelberg Games in the Real-World: Addressing Bounded Rationality and Limited Observations in Human Cognition *Artificial Intelligence Journal (AIJ)*, 174(15):1142-1171, 2010.
- [J27] M. Jain, J. Pita, J. Tsai, C. Kiekintveld, S. Rathi, F. Ordonez, M. Tambe Software Assistants for patrol planning at LAX and Federal Air Marshals Service. *Interfaces*, 40(4):267-290, 2010. **Finalist, EURO Excellence in Practice Award EEPA'2010**
- [J26] M. Taylor, C. Kiekintveld, C. Western, M. Tambe A Framework for Evaluating Deployed Security Systems: Is There a Chink in your ARMOR? In *Informatica*, 34:129-139, 2010.
- [J25] M. Tasaki, Y. Yabu, Y. Iwanari, M. Yokoo, J. Marecki, P. Varakantham, M. Tambe Introducing Communication in Dis-POMDPs with Locality of Interaction *Journal of Web Intelligence and Agent Systems (WIAS)*, 8(3):303-311, 2010.
- [J24] E. Bowring, M. Tambe, M. Yokoo Balancing local resources and global goals in multiply-constrained DCOP *Journal of Multiagent and Grid Systems (MAGS)*, 6(4):353-393, 2010.

- [J23] P. Paruchuri, J. Pearce, J. Marecki, M. Tambe, F. Ordonez, S. Kraus Coordinating randomized policies for increasing security of agent systems In *Journal of Information Technology and Management (ITM)*, 10:67–79, 2009.
- [J22] R. Maheswaran, J. Pearce, P. Varakantham, E. Bowring, M. Tambe Privacy Loss in Distributed Constraint Reasoning: A Quantitative Framework for Analysis and its Applications *Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS)*, 13(1):27–60, 2006.
- [J21] R. Nair, M. Tambe A Hybrid BDI-POMDP Framework for Multiagent Teaming *Journal of Artificial Intelligence Research (JAIR)*, 23:367–420, 2005
- [J20] P. Modi, W. Shen, M. Tambe, M. Yokoo ADOPT:Asynchronous distributed constraint optimization with quality gurantees *Artificial Intelligence Journal(AIJ)*. 161:149–180, 2005.
- [J19] N. Schurr, J. Marecki, M. Tambe, P. Scerri Towards flexible coordination of human-agent teams *Multiagent and Grid Systems – an International Journal (MAGS)*. 1:3-16, 2005.
- [J18] R. Nair, M. Tambe, S. Marsella, T. Raines Automated assistants for analyzing team behaviors *Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS)*. 8:69–111, 2004.
- [J17] D.V. Pynadath and M. Tambe. Automated teamwork among heterogeneous software agents and humans. *Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS)*. 7:71–100, 2003.
- [J16] P. Scerri, D.V. Pynadath, M. Tambe Towards Adjustable Autonomy for the Real World *Journal of Artificial Intelligence Research (JAIR)*. 17:171–228 , 2002
- [J15] G. Kaminka, D.V. Pynadath and M. Tambe. Monitoring teams by overhearing: A multiagent plan-recognition approach *Journal of Artificial Intelligence Research (JAIR)*. 17:83–135, 2002.
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### Refereed Technical Magazine Articles

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- [M22] A. Yadav, H. Chan, A.X. Jiang, H. Xu, E. Rice, R. Petering, M. Tambe Using Social Networks to Raise HIV Awareness Among Homeless Youth In *IBM Journal of Research and Development* 61(6):4:1-4:10, 2017.
- [M21] N. Sintov, D. Kar, T. Nguyen, F. Fang, K. Hoffman, A. Lyet, M. Tambe Keeping it Real: Using Real-World Problems to Teach AI to Diverse Audiences Abbreviated title: Keeping it real to teach AI In *AI Magazine*, 38(2):35-47, 2017.
- [M20] F. Fang, T. Nguyen, R. Pickles, W.Y. Lam, G.R. Clements2, B. An, A. Singh, B.C. Schwedock, M. Tambe, A. Lemieux PAWS A Deployed Game-Theoretic Application to Combat Poaching In *AI Magazine* 38(1):23-36, 2017.
- [M19] A. Yadav, L. Marcolino, E. Rice, R. Petering, H. Winetrobe, H. Rhoades, M. Tambe, H. Carmichael PSINET: A Decision Aid for Preventing HIV Spread Amongst Homeless Youth by Planning Ahead In *AI Magazine*, 37(2):47-62, 2016.

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### **Rigorously Refereed Conferences: *Full Papers***

(Typical acceptance rates for these conferences are usually about 25% or less)

- [C198] S. Gholami, A. Yadav, L.T. Thanh, B. Dilkina, M. Tambe Don't Put All Your Strategies in One Basket: Playing Green Security Games with Imperfect Prior Knowledge In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2019
- [C197] B. Wilder, B. Dilkina, M. Tambe Melding the Data-Decisions Pipeline: Decision-Focused Learning for Combinatorial Optimization In *AAAI conference on Artificial Intelligence (AAAI)*, February, 2019
- [C196] Q. Guo, J. Gan, L. Tran-Thanh, F. Fang, B. An, M. Tambe On the Inducibility of Stackelberg Equilibrium in Security Games In *AAAI conference on Artificial Intelligence (AAAI)*, February, 2019
- [C195] A. Rahmattalabi, P. Vayanos, M. Tambe A Robust Optimization Approach to Designing Near-Optimal Strategies for Constant-Sum Monitoring Games In *Proceedings of the International Conference on Decision and Game Theory for Security (GameSec)*, November, 2018
- [C194] H. Ou, B. Dilkina, P. Vayanos, M. Tambe Imbalanced Collusive Security Game In *Proceedings of the International Conference on Decision and Game Theory for Security (GameSec)*, November, 2018
- [C193] A. Sinha, A. Schlenker, D. Dmello, M. Tambe Scaling-up Stackelberg Security Games Applications using Approximations In *Proceedings of the International Conference on Decision and Game Theory for Security (GameSec)*, November, 2018
- [C192] H. Chan, E. Rice, P. Vayanos, M. Tambe, M. Morton From Empirical Analysis to Public Policy: Evaluating Housing Systems for Homeless Youth In *Proceedings European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD)*, September, 2018
- [C191] A. Sinha, F. Fang, B. An, C. Kiekintveld, M. Tambe Stackelberg Security Games: Looking Beyond a Decade of Success In *International Joint Conference on Artificial Intelligence (IJCAI)*, **Survey Track** July, 2018



- [C190] A. Yadav, B. Wilder, R. Petering, E. Rice, J. Craddock, A. Yoshioka-Maxwell, M. Hemler, L. Onasch-Vera, M. Tambe, D. Woo Bridging the Gap Between Theory and Practice in Influence Maximization: Raising Awareness about HIV among Homeless Youth In *International Joint Conference on Artificial Intelligence (IJCAI)*, **Sister Conference Best Paper Track** July, 2018
- [C189] S. McCarthy, C.M. Laan, K. Wang, A. Sinha, P. Vayanos, M. Tambe The Price of Usability: Designing Operationalizable Strategies for Security Games In *International Joint Conference on Artificial Intelligence (IJCAI)*, July, 2018
- [C189] E. Cranford, C. Lebiere, C. Gonzalez, S. Cooney, P. Vayanos, M. Tambe Learning about Cyber Deception through Simulations: Predictions of Human Decision Making with Deceptive Signals in Stackelberg Security Games In *Cognitive Science Society Meeting (CogSci)*, July, 2018
- [C188] E. Bondi, D. Dey, A. Kapoor, J. Plavis, S. Shah, F. Fang, B. Dilkina, R. Hannaford, A. Iyer, L. Joppa, M. Tambe AirSim-W: A Simulation Environment for Wildlife Conservation with UAVs In *ACM SIGCAS Conference on Computing and Sustainable Societies (COMPASS)*, June, 2018
- [C187] A. Yadav, R. Noothigattu, E. Rice, L. Onasch-Vera, L. Marcolino, M. Tambe Please be an Influencer? Contingency Aware Influence Maximization In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July, 2018
- [C186] K. Wang, Q. Guo, P. Vayanos, M. Tambe, B. An Equilibrium Refinement in Security Games with Arbitrary Scheduling Constraints In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July, 2018
- [C185] A. Schlenker, O. Thakoor, F. Fang, M. Tambe, L. Tran-Thanh, P. Vayanos, E. Vorobeychik, H. Xu Deceiving Cyber Adversaries: A Game-Theoretic Approach In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July, 2018
- [C184] S. Gholami, S. Mc Carthy, B. Dilkina, A. Plumptre, M. Tambe, M. Driciru, F. Wanyama, A. Rwet-siba, M. Nsubaga, J. Mabonga, E. Enyel, T. Okello Adversary models account for imperfect crime data: Forecasting and planning against real-world poachers In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July, 2018
- [C183] L. Hu, B. Wilder, A. Yadav, E. Rice, M. Tambe Activating the "Breakfast Club": Modeling Influence Spread in Natural-World Social Networks In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July, 2018
- [C182] B. Wilder, L. Onasch-Vera, J. Hudson, J. Luna, N. Wilson, R. Petering, D. Woo, M. Tambe, E. Rice End-to-End Influence Maximization in the Field In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July, 2018
- [C181] B. Wilder, H.C. Ou, K. de la Haye, M. Tambe, Optimizing network structure for preventative health In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July, 2018
- [C180] M.J. Azizi, P. Vayanos, B. Wilder, E. Rice, M. Tambe Designing Fair, Efficient, and Interpretable Policies for Prioritizing Homeless Youth for Housing Resources In *International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR)*, June, 2018

- [C179] H. Chan, L. Tran-Thanh, B. Wilder E. Rice, P. Vayanos, M. Tambe, Utilizing Housing Resources for Homeless Youth Through the Lens of Multiple Multi-Dimensional Knapsacks In *Conference on AI, Ethics and Society (AIES)*, February, 2018
- [C178] S. Seo, H. Chan, P.J. Brantingham, J. Leap, P. Vayanos, M. Tambe, Y. Liu Partially Generative Neural Networks for Gang Crime Classification with Partial Information In *Conference on AI, Ethics and Society (AIES)*, February, 2018
- [C177] H. Xu, K. Wang, P. Vayanos, M. Tambe Strategic Coordination of Human Patrollers and Mobile Sensors with Signaling for Security Games In *AAAI Conference on Artificial Intelligence (AAAI)*, February, 2018
- [C176] N. Kamra, U. Gupta, F. Fang, Y. Liu, M. Tambe Policy Learning for Continuous Space Security Games using Neural Networks In *AAAI Conference on Artificial Intelligence (AAAI)*, February, 2018
- [C175] B. Wilder, S. Suen, M. Tambe Preventing infectious disease in dynamic populations under uncertainty In *AAAI Conference on Artificial Intelligence (AAAI)*, February, 2018
- [C174] B. Wilder, N. Immerlica, E. Rice, M. Tambe Maximizing influence in an unknown social network In *AAAI Conference on Artificial Intelligence (AAAI)*, February, 2018
- [C173] E. Bondi, F. Fang, M. Hamilton, D. Kar, D. Dmello, J. Choi, A. Iyer, R. Hannaford, M. Tambe, R. Nevatia SPOT Poachers in Action: Augmenting Conservation Drones with Automatic Detection in Near Real Time In *Conference on Innovative Applications of Artificial Intelligence (IAAI-18)*, February 2018
- [C172] E. Bondi, F. Fang, D. Kar, V. Noronha, D. Dmello, M. Tambe, A. Iyer, R. Hannaford VIOLA: Video Labeling Application for Security Domains In *Conference on Decision Theory and Game Theory for Security (GameSec)*, October 2017
- [C171] H. Xu, B. Ford, F. Fang, B. Dilkina, A. Plumptre, M. Tambe, M. Driciru, F. Wanyama, A. Rwetsiba, M. Nsubaga, J. Mabonga Optimal Patrol Planning for Green Security Games with Black-Box Attackers In *Proceedings Conference on Decision Theory and Game Theory for Security (GameSec)*, October 2017
- [C170] S. Gholami, B. Ford, F. Fang, A. Plumptre, M. Tambe, M. Driciru, F. Wanyama, A. Rwetsiba, M. Nsubaga, J. Mabonga Taking it for a Test Drive: A Hybrid Spatio-temporal Model for Wildlife Poaching Prediction Evaluated through a Controlled Field Test In *Proceedings European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD)*, September 2017
- [C169] A. Yadav, H. Chan, A. Jiang, H. Xu, E. Rice, M. Tambe AI in Service of Homeless Shelters: Dynamic Influence Maximization under Uncertainty In *International Joint Conference on Artificial Intelligence (IJCAI)*, **Best Paper Track**, August 2017
- [C168] S. Mc Carthy, P. Vayanos, M. Tambe Staying Ahead of the Game: Adaptive Robust Optimization for Dynamic Allocation of Threat Screening Resources In *International Joint Conference on Artificial Intelligence (IJCAI)*, August 2017

- [C167] A. Schlenker, M. Guirguis, A. Sinha, C. Kiekintveld, M. Tambe, N. Dunstatter, D. Balderas, S. Sonya Dont Bury your Head in Warnings: A Game-Theoretic Approach for Intelligent Allocation of Cyber-security Alerts In *International Joint Conference on Artificial Intelligence (IJCAI)*, August 2017
- [C166] D. Kar, S. Sengupta, E. Kamar, E. Horvitz, M. Tambe Believe It or Not: Modeling Adversary Belief Formation in Stackelberg Security Games with Varying Information In *Conference on Advances in Cognitive Systems (ACS)*, May, 2017
- [C165] B. Wilder, A. Yadav, N. Immorlica, E. Rice, M. Tambe Uncharted but not Uninfluenced: Influence Maximization with an Uncertain Network In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2017
- [C164] A. Yadav, B. Wilder, R. Petering, E. Rice, J. Craddock, A. Yoshioka-Maxwell, M. Hemler, L. Onasch-Vera, M. Tambe, D. Woo Influence Maximization in the Field: The Arduous Journey from Emerging to Deployed Application In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2017
- [C163] D. Kar\*, B. Ford\*, S. Gholami, F. Fang, M. Tambe, A. Plumptre, M. Driciru, F. Wanayama, A. Rwetsiba (\* Both Kar and Ford are first authors of this article.) Cloudy with a Chance of Poaching: Adversary Behavior Modeling and Forecasting with Real-World Poaching Data In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2017
- [C162] A. Mukhopadhyay, C. Zhang, M. Tambe, K. Pence, P. Speer, Y. Vorobeychik Optimal Allocation of Police Patrol Resources Using a Continuous-Time Crime Model In *Conference on Decision and Game Theory for Security (GameSec)*, November, 2016
- [C161] S. Gholami, B. Wilder, M. Brown, D. Thomas, N. Sintov, M. Tambe Divide to Defend: Collusive Security Games In *Conference on Decision and Game Theory for Security (GameSec)*, November, 2016
- [C160] S. Mc Carthy, A. Sinha, M. Tambe, P. Manadhata Data Exfiltration Detection and Prevention: Virtually Distributed POMDPs for Practically Safer Networks In *Conference on Decision and Game Theory for Security (GameSec)*, November, 2016
- [C159] A. Schlenker, M. Brown, A. Sinha, M. Tambe, R. Mehta Get Me to My GATE On Time: Efficiently Solving General-Sum Bayesian Threat Screening Games In *European Conference on Artificial Intelligence (ECAI)*, August, 2016
- [C158] Y. Abbasi, N. Ben Asher, C. Gonzalez, D. Morrison, N. Sintov, M. Tambe Adversaries Wising Up: Modeling Heterogeneity and Dynamics of Behavior In *International Conference on Cognitive Modeling (ICCM)*, August, 2016
- [C157] N. Haghtalab, F. Fang, T. Nguyen, A. Sinha, A. Procaccia, M. Tambe Three strategies to success: Learning adversary models in security game In *International Joint Conference on Artificial Intelligence (IJCAI)*, July, 2016
- [C156] A. Yadav, H. Chan, A. Jiang, H. Xu, E. Rice, M. Tambe Using Social Networks to Aid Homeless Shelters: Dynamic Influence Maximization under Uncertainty In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, **Best student paper award**, May, 2016

- [C155] T. Nguyen, A. Sinha, S. Gholami, A. Plumtre, L. Joppa, M. Tambe, M. Driciru, F. Wanyama, A. Rwetsiba, R. Critchlow, C. Beale CAPTURE: A New Predictive Anti-Poaching Tool for Wildlife Protection In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, **Finalist Best Application Paper Award**, May, 2016
- [C154] C. Zhang, V. Bucarey, A. Mukhopadhyay, A. Sinha, Y. Qian, Y. Vorobeychik, M. Tambe Using abstractions to solve opportunistic crime security games at scale In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2016
- [C153] Y. Qian, C. Zhang, B. Krishnamachari, M. Tambe Restless Poachers: Handling Exploration-Exploitation Tradeoffs in Security Domains In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2016
- [C152] H. Xu, R. Freeman, V. Conitzer, S. Dughmi, M. Tambe Signaling in Bayesian Stackelberg Games In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2016
- [C151] A. Sinha, D. Kar, M. Tambe Learning Adversary Behavior in Security Games: A PAC Model Perspective In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2016
- [C150] M. Brown\*, A. Sinha\*, A. Schlenker, M. Tambe (\* Both Brown and Sinha are first authors of this article.) One Size Does Not Fit All: A Game-Theoretic Approach for Dynamically and Effectively Screening for Threats In *AAAI Conference on Artificial Intelligence (AAAI)*, February, 2016
- [C149] S. Mc Carthy, C. Kiekintveld, A. Killion, M. Gore, M. Tambe Preventing Illegal logging: Simultaneous Optimization of Resource Teams and Tactics for Security In *AAAI Conference on Artificial Intelligence (AAAI)*, February, 2016
- [C148] F. Fang, T. Nguyen, R. Pickles, W. Y. Lam, G. R. Clements, B. An, A. Singh, M. Tambe, A. Lemieux. Deploying PAWS: Field Optimization of the Protection Assistant for Wildlife Security. In *Innovative Applications of Artificial Intelligence (IAAI)*, **Innovative Application Award**, February 2016 (deployed application track).
- [C147] B. Ford, T. Nguyen, N. Sintov, M. Tambe and F.M. Delle Fave Beware the Soothsayer: Evaluating the Reliability of Attack Predictions in Stackelberg and Network Security Games In *Conference on Decision and Game Theory for Security (GameSec)*, November, 2015
- [C146] T. Nguyen, F. M. Delle Fave, D. Kar, A. Lakshminarayanan, A. Yadav, M. Tambe, N. Agmon, A. J. Plumtre, M. Driciru, F. Wanyama and A. Rwetsiba Making the most of Our Regrets: Regret-based Solutions to Handle Payoff Uncertainty and Elicitation in Green Security Games In *Conference on Decision and Game Theory for Security (GameSec)*, November, 2015
- [C145] H. Xu, A. Jiang, A. Sinha, Z. Rabinovich, S. Dughmi, M. Tambe Security Games with Information Leakage: Modeling and Computation In *International Joint Conference on Artificial Intelligence (IJCAI)*, July, 2015
- [C144] F. Fang, P. Stone and M. Tambe When Security Games Go Green: Designing Defender Strategies to Prevent Poaching and Illegal Fishing In *International Joint Conference on Artificial Intelligence (IJCAI)*, **Outstanding Paper Award, Computational Sustainability Track**, July, 2015

- [C143] Y.D. Abbasi, M. Short, A. Sinha, N. Sintov, C. Zhang and M. Tambe Human Adversaries in Opportunistic Crime Security Games: Evaluating Competing Bounded Rationality Models In *International Conference on Advances in Cognitive Systems (ACS)*, May, 2015
- [C142] Y. Qian, W. Haskell, M. Tambe Robust Strategy against Unknown Risk-averse Attackers in Security Games In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2015
- [C141] C. Zhang, A. Sinha, M. Tambe Keeping pace with criminals: Designing patrol allocation against adaptive opportunistic criminals In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2015
- [C140] D. Kar, F. Fang, F.M. Delle Fave, N. Sintov, M. Tambe, "A Game of Thrones": When Human Behavior Models Compete in Repeated Stackelberg Security Games In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2015
- [C139] V. Nagarajan\*, L. Marcolino\*, M. Tambe (\* Both Nagarajan and Marcolino are first authors of this article.) Every Team Deserves a Second Chance: Identifying When Things Go Wrong In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May, 2015
- [C138] H. Xu, Z. Rabinovich, S. Dughmi and M. Tambe Two-Stage Security Games — Exploring Information Asymmetry In *AAAI Conference on Artificial Intelligence (AAAI)*, January, 2015
- [C137] B. Bosansky, A. Jiang, M. Tambe, C. Kiekintveld Combining Compact Representation and Incremental Generation in Large Games with Sequential Strategies In *AAAI conference on Artificial Intelligence (AAAI)*, January, 2015
- [C136] A. Yadav, L. Marcolino, E. Rice, R. Petering, H. Winetrobe, H. Rhoades, M. Tambe, H. Carmichael Preventing HIV Spread in Homeless Populations Using PSINET In *Innovative Applications of Artificial Intelligence (IAAI)*, January, 2015
- [C135] A. Jiang, L. Marcolino, A. Procaccia, T. Sandholm, N. Shah, M. Tambe Diverse Randomized Agents Vote to Win In *Neural Information Processing Systems (NIPS)*, December 2014.
- [C134] M. Brown, W. Haskell, M. Tambe Addressing Scalability and Robustness in Security Games with Multiple Boundedly Rational Adversaries In *Conference on Decision and Game Theory for Security (GameSec)*, November 2014.
- [C133] C. Zhang, A. Jiang, M. Short, J. Brantingham, M. Tambe Defending Against Opportunistic Criminals: New Game-Theoretic Frameworks and Algorithms In *Conference on Decision and Game Theory for Security (GameSec)*, November 2014.
- [C132] E. Shieh, A. Jiang, A. Yadav, P. Varakantham, M. Tambe Unleashing Dec-MDPs in Security Games: Enabling Effective Defender Teamwork In *European Conference on Artificial Intelligence (ECAI)*, August 2014.
- [C131] H. Xu, F. Fang, A. Jiang, S. Dughmi, M. Tambe, V. Conitzer Solving Zero-Sum Security Games in Discretized Spatio-Temporal Domains In *Conference on Artificial Intelligence (AAAI)*, July 2014.
- [C130] L. S. Marcolino, H. Xu, A. Jiang, E. Bowring, M. Tambe Give a Hard Problem to a Diverse Team: Exploring Large Action Spaces In *Conference on Artificial Intelligence (AAAI)*, July 2014.

- [C129] T. Ngueyn, A. Yadav, B. An, M. Tambe, C. Boutilier Regret-based Optimization and Preference Elicitation for Stackelberg Security Games with Uncertainty In *Conference on Artificial Intelligence (AAAI)*, July 2014.
- [C128] M. Brown, S. Saisubramanian, P. Varakantham , M. Tambe STREETS: Game-Theoretic Traffic Patrolling with Exploration and Exploitation In *Conference on Innovative Applications of Artificial Intelligence (IAAI)*, July 2014.
- [C127] W. Haskell, D. Kar, F. Fang, M. Tambe, S. Cheung, E. Denicola Robust protection of fisheries with COMPASS In *Conference on Innovative Applications of Artificial Intelligence (IAAI)*, July 2014.
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### **Rigorously Reviewed Conferences: *Short Papers or Posters***

- [S37] N. Kamra, U. Gupta, F. Fang, Y. Liu, M. Tambe Deep Fictitious Play for Games with Continuous Action Spaces In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2019
- [S36] S. Cooney, E. Cranford, C. Lebiere, C. Gonzalez, P. Vayanos, M. Tambe Warning Time: Optimizing Strategic Signaling for Security Against Boundedly Rational Adversaries In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2019
- [S35] E. Bondi, H. Oh, F. Fang, H. Xu, B. Dilkina, M. Tambe Broken Signals in Security Games: Coordinating Patrollers and Sensors in the Real World In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2019
- [S34] O. Thakur, H. Xu, C. Kiekintveld, P. Vayanos, M. Tambe General-Sum Cyber Deception Games under Partial Attacker Valuation Information In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2019
- [S33] A. Rahmatalabi, P. Vayanos, M. Tambe Robust Monitoring on Graphs with an Application to Suicide Prevention in Social Networks In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2019
- [S32] H. Xu, M. Tambe, S. Dughmi, V.L. Noronha Mitigating the Curse of Correlation in Security Games by Entropy Maximization In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2018
- [S31] Q. Guo, J. Gan, F. Fang, L. Tran-Thanh, M. Tambe, B. An On the Weakness of Strong Stackelberg Equilibrium for Security Games In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2018
- [S30] S. Gholami, B. Wilder, M. Brown, D. Thomas and N. Sintov and M. Tambe Divide to Conquer: Toward Addressing Collusion among Human Adversaries in Security Games In *European Conference on AI (ECAI)*, August 2016

- [S30] Y. Abbasi, C. Gonzalez, D. Kar, N. Sintov, N. Ben Asher, D. Morrison, M. Tambe Know Your Adversary: Insights for a Better Adversarial Behavioral Model In *Annual Meeting of the Cognitive Science Society (CogSci)*, July 2016
- [S29] L. Marcolino, A. Lakshminarayanan, A. Yadav, M. Tambe Simultaneous Influencing and Mapping Social Networks In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2015
- [S28] F. Fang, P. Stone, M. Tambe Planning Defender Strategies Against Attackers In Domains Involving Frequent Adversary Interaction: An initial report In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2015
- [S27] C. Zhang, A. Jiang, M. Tambe, M. Short, J. Brantingham Towards a game theoretic approach for defending against crime diffusion In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2014
- [S26] F.M. DelleFave, M. Brown, A. Jiang, E. Shieh, C. Zhang, M. Tambe Security Games In the Field: Deployments on a Transit System In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2014
- [S25] T. Nguyen, A. Azaria, J. Pita, R. Maheswaran, S. Kraus, M. Tambe Addressing Human Adversaries in Security Games: To Model Human Decision Making or not? In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2013
- [S24] J. Tsai, Y. Qian, C. Kiekintveld, Y. Vorobeychik, M. Tambe Security Games for Controlling Contagion Under Asymmetric Information: The Power of Simple In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2013
- [S23] J. Tsai, E. Bowring, S. Marsella, W. Wood, M. Tambe A Study of Emotional Contagion with Virtual Characters In *International Conference on Intelligent Virtual Agents (IVA)*, September 2012.
- [S22] R. Yang, A. Jiang, F. Fang, R. Maheswaran, M. Tambe Designing Better Strategies against Human Adversaries in Graph-Based Security Games In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, June 2012.
- [S21] J. Pita, R. John, R. Yang, R. Maheswaran, S. Kraus, M. Tambe A Robust Approach to Addressing Human Adversaries in Security Games In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, June 2012.
- [S20] J. Tsai, E. Bowring, S. Marsella, W. Wood, M. Tambe Emotional Contagion with Virtual Characters In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, June 2012.
- [S19] Y. Vorobeychik, B. An, M. Tambe Infinite Horizon Adversarial Patrolling on Networks In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, June 2012.
- [S18] J. Kwak, R. Yong, Z. Yin, M.E. Taylor, M. Tambe Towards Addressing Model Uncertainty: Robust Execution-time Coordination for Teamwork In *IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT)*, August 2011



- [S17] J. Kwak, R. Yong, Z. Yin, M.E. Taylor, M. Tambe Teamwork in Distributed POMDPs: Execution-time Coordination Under Model Uncertainty In *International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2011
- [S16] R. Yang, F. Ordonez, R. John, C. Kiekintveld, M. Tambe Improved Computational Models of Human Behavior in Security Games In *International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2011
- [S15] C. Kiekintveld, J. Marecki, M. Tambe Methods and Algorithms for Infinite Bayesian Stackelberg Security Games In *Decision and Game Theory for Security (GameSec 2010)*, May 2010
- [S14] C. Kiekintveld, J. Marecki, M. Tambe Robust Bayesian Methods for Stackelberg Security Games In *International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2010
- [S13] J. Tsai, J. Kwak, Z. Yin, C. Kiekintveld, D. Kempe, M. Tambe How to Protect a City: Strategic Security Placement in Graph-Based Domains In *International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2010
- [S12] N. Schurr, J. Marecki, M. Tambe RIAACT: A robust approach to adjustable autonomy for human-multiagent teams In *Seventh International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2008
- [S11] R. Greenstadt, J.P. Pearce, E. Bowring, M. Tambe Experimental analysis of privacy loss in DCOP algorithms In *Fifth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, May 2006
- [S10] R. Nair, P. Varakantam, M. Tambe, M. Yokoo Networked Distributed POMDPs: A Synergy of Distributed Constraint Optimization and POMDPs In *International Joint Conference on Artificial Intelligence (IJCAI)*, July 2005
- [S9] J.P. Pearce, R. Maheswaran, M. Tambe A Theoretical Foundation for Incomplete Algorithms for Distributed Constraint Optimization In *Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July 2005
- [S8] N. Schurr, J. Marecki, M. Tambe, N. Kasunadhini, J. P. Lewis, P. Scerri The DEFACTO System for Human Omnipresence to Coordinate Agent Teams In *Fourth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July 2005
- [S7] S.M. Raza Ali, S. Koenig, M. Tambe Preprocessing Techniques for Distributed Constraint Optimization In *International Joint Conference on Principles and Practices of Constraint Programming (CP)*, 2004 (Short Paper)
- [S6] P. Scerri, M. Tambe, S. Okamoto, A. Farinelli Allocating Roles in Extreme Teams In *Third International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July 2004
- [S5] H. Jung and M. Tambe On Communication in Distributed Constraint Satisfaction In *Third International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, July 2004
- [S4] H. Jung, M. Tambe, W. Shen, W. Zhang. Towards large-scale conflict resolution: Initial results In *International Conference on Multi-Agent Systems (ICMAS)*, July 2000.

- [S3] D. Pynadath, M. Tambe, and N. Chauvat. Building dynamic organizations of distributed, heterogeneous agents In *Fourth International Conference on Autonomous Agents (Agents)*, May 2000.
- [S2] Z. Qiu, M. Tambe, and H. Jung. Towards flexible negotiation in teamwork. In *Third International Conference on Autonomous Agents (Agents)*, May 1999.
- [S1] G. Kaminka and M. Tambe. Agent component synergy: Social comparison for failure detection. In *Second International Conference on Autonomous Agents (Agents)*, May 1998.

### Other Conference Papers

- [O22] B. Ford, M. Brown, A. Yadav, A. Singh, A. Sinha, B. Srivastava, C. Kiekintveld, M. Tambe Protecting the NECTAR of the Ganga River through Game-Theoretic Factory Inspections In *International Conference on Practical Applications of Agents and Multi-Agent Systems (PAAMS)*, June, 2016
- [O21] M. Dehghani, M.H. Immordino-Yang, J. Graham, S. Marsella, K. Forbus, J. Ginges, M. Tambe and R. Maheswaran Computational Models of Moral Perception, Conflict and Elevation In *International Association for Computing and Philosophy (IACAP)*, 2013
- [O20] N. Li, J. Kwak, B. Becerik-Gerber, M. Tambe Predicting HVAC Energy Consumption in Commercial Buildings Using Multi-Agent Systems *Construction Research Congress*, 2013.
- [O19] M. Pujol-Gonzalez, J. Cerquides, P. Meseguer, J. A. Rodriguez Aguilar and M. Tambe Engineering the decentralized coordination of UAVs with limited communication range *Conference of the Spanish Association for Artificial Intelligence (CAEPIA)*, 2013.
- [O18] M. Tambe, M. Jain, J. Pita, A. Jiang Game Theory for Security: Key Algorithmic Principles, Deployed Systems, Lessons Learned *50th Annual Allerton Conference on Communication, Control, and Computing*, 2012.
- [O17] F. Jazizadeh, G. Kavulya, J. Kwak, B. Becerik-Gerber, M. Tambe, W. Wood Human-Building Interaction for Energy Conservation in Office Buildings *Construction Research Congress*, 2012.
- [O16] J. Kwak, P. Scerri, M. Tambe, A. Freedy Multi Agent Autonomous Reasoning System (MAARS) for Satellite Defense *AIAA Infotech at Aerospace*, 2011
- [O15] J. Pita, M. Jain, C. Western, P. Paruchuri, J. Marecki, M. Tambe, F. Ordonez, S. Kraus Security via randomization: A game-theoretic model and its application to the Los Angeles International Airport *IEEE Conference on Technologies for Homeland Security*, 2008
- [O14] P. Scerri, K. Sycara, M. Tambe Adjustable autonomy in the context of coordination *First Intelligent Systems Technical Conference of the American Institute of Aeronautics and Astronautics*, 2004
- [O13] P. Scerri, P.J. Modi, M. Tambe, W. Shen Are multiagent algorithms relevant for robotic applications: A case study of distributed constraint algorithms In *ACM symposium on applied computing*, 2003
- [O12] T. Ito, R. Nair, M. Tambe, S. Marsella. On a task allocation mechanism among agents based on an auction mechanism in the Robocup Rescue simulation. In *Society of Instrument and Control Engineering Systems integration division Annual Conference*, 2002.

- [O11] R. Hill, J. Chen, J. Gratch, P. Rosenbloom, and M. Tambe. Soar-RWA: Planning, teamwork, and intelligent behavior for synthetic rotary wing aircraft. In *Seventh Conference on Computer Generated Forces and Behavioral Representation*, July 1998.
- [O10] G. Kaminka, M. Tambe, and C. Hopper. The role of agent modeling in agent robustness. In *AI meets the Real-World conference*, September 1998.
- [O9] Tambe M. Flexible teamwork for intelligent simulated pilot agents. In *Sixth Conference on Computer Generated Forces and Behavioral Representation*, July 1996.
- [O8] Tambe M. and P. S. Rosenbloom. Agent tracking in complex multi-agent environments: New results. In *Fifth Conference on Computer Generated Forces and Behavioral Representation*, May 1995.
- [O7] Tambe M., K. Schwamb, and P. S. Rosenbloom. Building intelligent pilots for simulated rotary wing aircraft. In *Fifth Conference on Computer Generated Forces and Behavioral Representation*, May 1995.
- [O6] Tambe M. and P. S. Rosenbloom. Event tracking in complex multi-agent environments. In *Fourth Conference on Computer Generated Forces and Behavioral Representation*, May 1994.
- [O5] R. Jones, J. E. Laird, P. S. Rosenbloom, and M. Tambe. Generating behavior in response to interacting goals. In *Fourth Conference on Computer Generated Forces and Behavioral Representation*, May 1994.
- [O4] P. Rosenbloom, W. L. Johnson, R. M. Jones, F. Koss, J. E. Laird, J. F. Lehman, R. Rubinoff, K. Schwamb, and M. Tambe. Intelligent automated agents for tactical air simulation: A progress report. In *Fourth Conference on Computer Generated Forces and Behavioral Representation*, May 1994.
- [O3] R. M. Jones, M. Tambe, J. E. Laird, and P. Rosenbloom. Intelligent automated agents for flight training simulators. In *Third Conference on Computer Generated Forces and Behavioral Representation*, March 1993.
- [O2] I. Stobie, M. Tambe, and P. Rosenbloom. Flexible integration of path-planning capabilities. In *SPIE conference on Mobile Robots*, November 1992.
- [O1] M. Tambe, Kalp. D., and P. Rosenbloom. An efficient algorithm for production systems with linear-time match. In *International Conference on Tools of Artificial Intelligence*, November 1992.

## Book Chapters

- [BC63] F. Fang, M. Tambe, B. Dilkina, A. Plumptre Introduction: Artificial Intelligence and Conservation In F. Fang, M. Tambe, B. Dilkina, A. Plumptre editors *Artificial Intelligence and Conservation*, Cambridge University Press, 2018
- [BC62] E. Bondi, F. Fang, M. Hamilton, D. Kar, D. Dmello, V. Noronha, J. Choi, R. Hannaford, A. Iyer, L. Joppa, M. Tambe, R. Nevatia Augmenting Conservation Drones with Automatic Poacher Detection in Near Real Time In F. Fang, M. Tambe, B. Dilkina, A. Plumptre editors *Artificial Intelligence and Conservation*, Cambridge University Press, 2018

- [BC61] S. Gholami, B. Ford, F. Fang, A. Plumtre, M. Tambe, M. Driciru, F. Wanyama, A. Rwetsiba, M. Nsubaga, J. Mabonga Wildlife Poaching Forecasting based on Ranger-collected Data and Evaluation through Field Tests In F. Fang, M. Tambe, B. Dilkina, A. Plumtre editors *Artificial Intelligence and Conservation*, Cambridge University Press, 2018
- [BC60] E. Rice, M. Tambe Introduction: Artificial Intelligence and Social Work In M. Tambe, E. Rice editors *Artificial Intelligence and Social Work*, Cambridge University Press, 2018
- [BC59] A. Yadav, B. Wilder, H. Chan, A. Jiang, H. Xu, E. Rice, M. Tambe Using Social Networks to Raise HIV Awareness Among Homeless Youth In M. Tambe, E. Rice editors *Artificial Intelligence and Social Work*, Cambridge University Press, 2018
- [BC58] B. Wilder, N. Immorlica, E. Rice, M. Tambe Influence maximization with unknown network structure In M. Tambe, E. Rice editors *Artificial Intelligence and Social Work*, Cambridge University Press, 2018
- [BC57] A. Yadav, B. Wilder, E. Rice, R. Petering, J. Craddock, A. Yoshioka-Maxwell, M. Hemler, L. Onasch-Vera, M. Tambe, D. Woo Influence Maximization in the Field: The Arduous Journey from Emerging to Deployed Application In M. Tambe, E. Rice editors *Artificial Intelligence and Social Work*, Cambridge University Press, 2018
- [BC56] N. Sintov, V. Seyranian, M. Tambe Adoption of Conservation Technologies In W. Moreto editors *Conservation and Criminology*, Temple University Press, 2017
- [BC55] D. Kar, T.H. Nguyen, F. Fang, M. Brown, A. Sinha, M. Tambe, A. X. Jiang Recent Trends and Applications in Security Games In T. Basar, G. Zaccour editors *Handbook of Dynamic Game Theory*, Springer, 2017
- [BC54] F. Fang, B. Ford, R. Yang, M. Tambe, A. Lemieux PAWS: Game Theory based Protection Assistant for Wildlife Security In M. Gore editors *Conservation Criminology*, Wiley, 2017
- [BC53] A. Yadav, H. Chan, A. Jiang, E. Rice, E. Kamar, B. Grosz, M. Tambe POMDPs for Assisting Homeless Shelters - Computational and Deployment Challenges In Osman, N., editors *Most Visionary Papers of the AAMAS'2017 workshops*, Springer, 2017
- [BC52] S. Mc Carthy, A. Sinha, M. Tambe Game Theoretic Defense for Maritime Security In F. Roberts, J. DiRenzo, N. Drumhiller, editors *Challenges in Maritime Cyber Security*, Wiley, 2017
- [BC51] S. Mc Carthy, A. Sinha, M. Tambe Data Exfiltration Detection and Prevention: Virtually Distributed POMDPs for Practically Safer Networks In R. Brigantic, editors *Applied Risk Analysis for Guiding Homeland Security Policy and Decisions*, Wiley, 2017
- [BC50] L. Marcolino, H. Xu, D. Gerber, B. Kolev, S. Price, E. Pantazis, M. Tambe Multiagent team formation for design problems In V. Dignum, editors *Post-proceedings of the Coordination, Organizations, Institutions and Norms in Agent Systems workshop*, Springer, 2016
- [BC49] T. Nguyen, D. Kar, M. Brown, A. Sinha, M. Tambe, and A.X. Jiang Towards a Science of Security Games In B. Toni editors *Interdisciplinary Mathematical Research and Applications*, Springer, 2016

- [BC48] A. Abbas, M. Tambe, D. Von Winterfeldt Introduction to Improving Homeland Security Decisions In A. Abbas, M. Tambe, D. Von Winterfeldt editors *Improving Homeland Security Decisions*, Cambridge University Press, 2016
- [BC47] M. Taylor, C. Kiekintveld, E. Shieh, F.M. DelleFave, M. Tambe Evaluating Deployed Decision Support Systems for Security: Challenges, Analysis, and Approaches In A. Abbas, M. Tambe, D. Von Winterfeldt editors *Improving Homeland Security Decisions*, Cambridge University Press, 2016
- [BC46] B. An, A. Sinha, M. Tambe Stackelberg Security Games (SSG) Basics and Application Overview In A. Abbas, M. Tambe, D. Von Winterfeldt editors *Improving Homeland Security Decisions*, Cambridge University Press, 2016
- [BC45] L. Marcolino, H. Xu, A. Jiang, M. Tambe, E. Bowring Team formation in large action spaces In N. Oren, P. Telang, editors *Post-proceedings of the Coordination, Organizations, Institutions and Norms in Agent Systems workshop*, Springer, 2014
- [BC44] F. M. Delle Fave, M. Brown, C. Zhang, E. Shieh, A. X. Jiang, H. Rosoff, M. Tambe, J. P. Sullivan. Security Games in the Field Deployments on a Transit System In: *Lecture Notes in Artificial Intelligence*. 2014
- [BC43] L. Marcolino, C. Zhang, A. Jiang, M. Tambe A detailed analysis of a multiagent diverse team In T. Balke, A. Chopra, F. Dignum and B. van Riemsdijk, editors *Post-proceedings of the Coordination, Organizations, Institutions and Norms in Agent Systems workshop*, Springer, 2013
- [BC42] F. Ordonez, M. Jain, C. Kiekintveld, J. Tsai, J. Jara, M. Tambe Deployed security games for patrol planning In J. Herrmann editors *Handbook of Operations Research for Homeland Security*, Springer, 2013
- [BC41] M. Jain, B. An, M. Tambe Security Games Applied to Real-World: Research Contributions and Challenges In S. Jajodia, A.K. Ghosh, V.S. Subramanian, V. Swarup, C. Wang, and X. S. Wang editors *Moving Target Defense II: Application of Game Theory and Adversarial Modeling*, Springer, 2012
- [BC40] B. An, M. Tambe Game Theory for Security: An Important Challenge for Multiagent Systems In M. Cossentino, G. Weiss, K. Tuyls and M. Kaisers editors *European Workshop on Multiagent Systems (EUMAS)*, Springer, 2012
- [BC39] E. Shieh, B. An, R. Yang, M. Tambe, J. Drenzo, C. Baldwin, B. Maule, K. Moretti PROTECT in the ports of Boston, New York and beyond: Experiences in Deploying Stackelberg Security Games with Quantal Response In V. Subramaniam editors *Handbook on Computational Approaches to Counterterrorism*, Springer, 2012
- [BC38] M. E. Taylor, M. Jain, C. Kiekintveld, Z. Yin, R. Yang, J. Kwak, M. Tambe Two decades of multiagent teamwork research: Past, present and future In C. Guttman and F. Dignum editors *Postproceedings of Collaborative Agents REsearch and Development (CARE) 2010*, Springer, 2011
- [BC37] E. Bowring, M. Tambe Bridging the Gap: Introducing Agents and Multiagent Systems to Undergraduate Students In M. Beer, M. Fasli, D. Richards editors *Multi-Agent Systems for Education and Interactive Entertainment: Design, Use and Experience* IGI Global, 2010

- [BC36] J. Pita, M. Jain, C. Western, P. Paruchuri, J. Marecki, M. Tambe, F. Ordonez, S. Kraus ARMOR Software: A game theoretic approach to airport security In P. Seidenstat editors *Protecting Airline Passengers in the Age of Terrorism*, Praeger Publishers, 2008
- [BC35] N. Schurr, M. Tambe Using Multiagent Teams to Improve Training of Incident Commanders In M. Pechoucek, S. G. Thompson, H. Voos editors *AAMAS technologies for military and security applications*, Springer and Birkhauser, 2007
- [BC34] N. Schurr, E. Bowring, P. Varakantham, M. Tambe, B. Grosz Asimovian multiagents: Applying laws of robotics to teams of agents and humans In R. Bordini, M. Dastani, J. Dix, A. Seghrouchni editors *workshop on programming multiagent systems*, Lecture notes in Artificial Intelligence, Springer, 2007
- [BC33] P. Paruchuri, M. Tambe, S. Kraus, F. Ordonez Coordinating Randomized policies for Increasing Security in Multiagent Systems In H. Mouratidis editors *workshop on Safety and Security in multiagent systems*, Lecture notes in Artificial Intelligence, Springer, 2007
- [BC32] J. Marecki, N. Schurr, M. Tambe Analyzing dangers in multiagent rescue using DEFACTO In H. Mouratidis editors *workshop on Safety and Security in multiagent systems*, Lecture notes in Artificial Intelligence, Springer, 2007
- [BC31] P. Varakantham, R. Maheswaran, M. Tambe Implementation Techniques for Solving POMDPs in Personal Assistant Domains In M. Dastani, J. Dix editors *workshop on Programming multiagent systems*, Lecture notes in computer science, Springer, 2006
- [BC30] P. Scerri, M. Tambe, K. Sycara Adjustable autonomy in the context of coordination In F. Massachi editors *Safety and security in multiagent systems*, Lecture notes in computer science, Springer, 2006.
- [BC29] N. Schurr, J. Marecki, M. Tambe, J.P. Lewis, N. Kasunadhini Agent-human teams for disaster rescue In M. Dastani, J. Dix, A. Elfallah, R. Bordini editors *Agent-oriented programming*, Kluwer academic publishers, 2005.
- [BC28] R. Nair, M. Tambe Hybrid BDI, POMDP approaches to teamwork In M. Dastani, J. Dix editors *workshop on Programming multiagent systems*, Lecture notes in computer science, Springer, 2005
- [BC27] J. Pearce, R. Maheswaran, M. Tambe DCOP Games In P. Scerri, R. Mailler editors *workshop on Challenges in the Coordination of Large Scale Multiagent Systems*, Lecture notes in computer science, Springer, 2005
- [BC26] N. Schurr, M. Tambe, J. Marecki Agent-based simulations for disaster rescue In J. Yen and R. Popp, editors, *"21st Century Enabling Technologies and Policies for Counter-Terrorism"*, Cambridge University Press, UK
- [BC25] P. Scerri, D. Pynadath, N. Schurr, S. Gandhe, M. Tambe Team-oriented programming and proxy agents: the next generation In M. Dastani, J. Dix editors *workshop on Programming multiagent systems*, Lecture notes in computer science, Springer, 2004
- [BC24] H. Jung and M. Tambe Performance modeling in large-scale multiagent systems: Using POMDP building blocks In T. Wagner editor, *Toward an Application Science: MAS Problem Spaces and Their Implications to Achieving Globally Coherent Behavior.*, Kluwer Academic publishers, Norwell, MA 2004.

- [BC23] R. Maheswaran, M. Tambe, P. Varakantam, K. Myers Adjustable autonomy: Challenges in personal assistant agents In M. Nickles, M. Rovatsos, G. Weiss, editors, "*Computational Autonomy - Potential, Risks, Solutions (Autonomy'03)*", Lecture Notes in Artificial Intelligence, Springer, 2004
- [BC22] N. Schurr, S. Okamoto, R. Maheswaran, M. Tambe, P. Scerri Belief-Desire-Intention approaches to teamwork In Ron Sun, editors, "*Cognitive Modeling and Multi-Agent Interactions*", Cambridge University Press, UK, 2004
- [BC21] V. Lesser, C. Ortiz, M. Tambe Introduction to distributed resource allocation In C. Ortiz, V. Lesser and M. Tambe editors, "*Distributed sensor nets: A multiagent perspective*", Kluwer Academic publishers, Norwell, MA 2003
- [BC20] P.J. Modi, P. Scerri, M. Tambe, W. Shen Distributed resource allocation: A distributed constraint reasoning approach In C. Ortiz, V. Lesser and M. Tambe editors, "*Distributed sensor nets: A multiagent perspective*", Kluwer Academic publishers, Norwell, MA 2003
- [BC19] H. Jung, R. Nair, M. Tambe and S. Marsella Towards a computational model for multiagent coordination analysis *IEEE/NASA workshop on Formal Approaches to Agent-based Systems*. Lecture Notes in AI, Springer, Heidelberg, Germany
- [BC18] R. Nair, S. Marsella, M. Tambe The role of emotions in teamwork In J.M. Fellous and M.A. Arbib editors, "*Who needs emotions: the brain meets the machine*". MIT Press, Cambridge, MA
- [BC17] R. Nair, M. Tambe, S. Marsella Team Formation for Reformation in Multiagent Domains like RoboCupRescue In G. Kaminka, P. Lima and R. Rojas, editors, *RoboCup'2002 symposium*. Springer, Heidelberg, Germany, 2002.
- [BC16] P. Scerri, D. V. Pynadath and M. Tambe. Experiences with Adjustable Autonomy and Safety in a Deployed Multi-agent system. In Hexmoor, Castelfranci and Falcone, editors, *Agents and Autonomy*, Kluwer Academic Publishers, Norwell, MA, 2002.
- [BC15] D. V. Pynadath and M. Tambe. Revisiting Asimov's first law: A response to the call to arms In Meyer and Tambe, editors, *Intelligent Agents, Volume VIII: workshop on Agents, theories, architectures and Languages*, Lecture Notes in AI 2333, Springer, Heidelberg, Germany, 2002.
- [BC14] P.J. Modi, H. Jung, M. Tambe, W. Shen, S. Kulkarni. Dynamic distributed resource allocation: A distributed constraint satisfaction approach In Meyer and Tambe, editors, *Intelligent Agents, Volume VIII: workshop on Agents, theories, architectures and Languages*, Lecture Notes in AI 2333, Springer, Heidelberg, Germany, 2002.
- [BC13] D. V. Pynadath and M. Tambe Electric Elves: Adjustable Autonomy in Real-World Multi-Agent Environments In *Socially Intelligent Agents – creating relationships with computers and Robots*, Kluwer Academic Publishers, Norwell, MA, 2002.
- [BC12] R. Nair, T. Ito, M. Tambe, S. Marsella Task allocation in the RoboCup Rescue simulation domain: A short note In *RoboCup'2001 symposium*. Springer, Heidelberg, Germany, 2002.
- [BC11] M. Tambe and D. V. Pynadath. Towards heterogeneous agent teams In *Multi-agent systems and applications, Advanced course in Artificial Intelligence (ACAI), 2001*, Springer, Heidelberg, Germany, 2001.

- [BC10] M. Tambe and D. V. Pynadath and P. Scerri. Adjustable Autonomy: A Response In *Intelligent Agents, Volume VII: workshop on Agents, theories, architectures and Languages*, Lecture Notes in AI 1986, Springer, Heidelberg, Germany, 2001.
- [BC9] D. V. Pynadath and M. Tambe and G. A Kaminka Adaptive infrastructures for agent integration. In *Proceedings of first International Workshop on Infrastructures for Scalable multi-agent systems*. Springer Verlag, Heidelberg, Germany, 2001.
- [BC8] H. Jung and M. Tambe. Conflicts in Agent Teams. In *Conflicts in Agents*. Kluwer Academic Publishers, Norwell, MA, 2000.
- [BC7] T. Raines, M. Tambe and S. Marsella. Automated assistants to aid humans in understanding team behaviors. In *RoboCup'99: third robot world cup competition and conferences*. Springer, Heidelberg, Germany, 1999.
- [BC6] D. Pynadath, M. Tambe, N. Chauvat and L. Cavedon. Towards team-oriented programming. In *Intelligent Agents, Volume VI: workshop on Agents, theories, architectures and Languages*, Springer, Heidelberg, Germany, 2000.
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- [BC4] S. Marsella, J. Adibi, Y. Alonaizon, A. Erdem, R. Hill, G. Kaminka, Z. Qiu, and M. Tambe. Using an explicit model of teamwork and learning in RoboCup'98: An extended abstract. In *RoboCup'98: second robot world cup competition and conferences*. Springer, Heidelberg, Germany, 1998.
- [BC3] G. Kaminka and M. Tambe. Social comparison for failure detection and recovery. In *Intelligent Agents, Volume IV: Lecture Notes in Artificial Intelligence*. Springer, Heidelberg, Germany, 1998.
- [BC2] M. Tambe, J. Adibi, Y. Alonaizon, A. Erdem, G. Kaminka, S. Marsella, I. Muslea and M. Tallis. Isis: Using an explicit model of teamwork in robocup'97. In *RoboCup'97: first robot world cup competition and conferences*. Springer, Heidelberg, Germany, 1998.
- [BC1] M. Tambe and P. Rosenbloom Architectures for agents that track other agents in multi-agent worlds. In *Intelligent Agents, Volume II: Lecture Notes in Artificial Intelligence*. Springer, Heidelberg, Germany, 1996.

## Symposium Papers

- [SY48] H. Chan, E. Rice, P. Vayanos, M. Tambe, M. Morton Evidence From the Past: AI Decision Aids to Improve Housing Systems for Homeless Youth Proc. of AAAI Fall Symposium Series on Cognitive Assistance in Government and Public Sector Applications, 2017
- [SY47] N. Sintov, D. Kar, T. Nguyen, F. Fang, K. Hoffman, A. Lyet, M. Tambe From the Lab to the Classroom and Beyond: Extending a Game-Based Research Platform for Teaching AI to Diverse Audiences AAAI Symposium on Education Advances in Artificial Intelligence (EAAI), 2016
- [SY46] M. Tambe, A. Jiang, B. An, M. Jain Computational game theory for security: Progress and challenges AAAI Spring Symposium on Applied Computational Game Theory, 2013



- [SY45] C. Zhang, A. Jiang, M. Short, J. Brantingham, M. Tambe Modeling Crime diffusion and crime suppression on transportation networks: An initial report AAAI Fall Symposium on Social Networks and Social Contagion, 2013
- [SY44] J. Kwak, B. Becerik-Gerber and M. Tambe Predicting HVAC Energy Consumption in Commercial Buildings Using Multiagent Systems International Symposium on Automation and Robotics in Construction and Mining (ISARC), 2013
- [SY43] J. Tsai, N. Weller, M. Tambe Analysis of Heuristic Techniques for Controlling Contagion AAAI Fall Symposium on Social Networks and Social Contagion, 2012
- [SY42] T. Nguyen, J. Tsai, A. Jiang, E. Bowring, R. Maheswaran, M. Tambe Security Games on Social Networks AAAI Fall Symposium on Social Networks and Social Contagion, 2012
- [SY41] M.P. Johnson, F. Fang, R. Yang, M. Tambe, H.J. Albers Challenges in Patrolling to Maximize Pristine Forest Area (Position Paper) AAAI Spring Symposium on Game Theory for Security, Sustainability and Health, 2012
- [SY40] M. Jain, M. Tambe, K. Leyton-Brown Which security games are hard to solve AAAI Spring Symposium on Game Theory for Security, Sustainability and Health, 2012
- [SY39] A. Jiang, Z. Yin, M.P. Johnson, C. Kiekintveld, M. Tambe, T. Sandholm, K. Leyton-Brown Towards Optimal Patrol Strategies for Fare Inspection in Transit Systems AAAI Spring Symposium on Game Theory for Security, Sustainability and Health, 2012
- [SY38] B. An, D. Kempe, C. Kiekintveld, E. Shieh, S. Singh, M. Tambe, Y. Vorobeychik Security Games with Limited Surveillance: An Initial Report AAAI Spring Symposium on Game Theory for Security, Sustainability and Health, 2012
- [SY37] Y. Vorobeychik, B. An, M. Tambe Adversarial Patrolling Games AAAI Spring Symposium on Game Theory for Security, Sustainability and Health, 2012
- [SY36] M. Tambe, B. An Game Theory for Security: A real-world challenge problem for multiagent systems and beyond AAAI Spring Symposium on Game Theory for Security, Sustainability and Health, 2012
- [SY35] L. Klein, G. Kavulya, F. Jazizadeh, J. Kwak, P. Varakantham, B. Becerik-Gerber and M. Tambe Towards Optimization of Building Energy and Occupant Comfort using Multiagent Simulation International Symposium on Automation and Robotics in Construction (ISARC), 2011
- [SY34] B. An, M. Jain, M. Tambe, C. Kiekintveld Mixed-Initiative Optimization in Security Games: A Preliminary Report AAAI Spring Symposium on Help me Help you: Bridging the Gaps in Human-Agent Collaboration
- [SY33] A. Freedy, O. Sert, E. Freedy, G. Weltman, J. McDonough, M. Tambe, T. Gupta, W. Grayson, P. Cabrera Multiagent adjustable autonomy framework (MAAF) for multirobot multihuman teams performing specialized tactical maneuvers In International Symposium on Collaborative Technologies and Systems, **Best Paper Award**, 2008
- [SY32] M. Tambe, A. Balsamo, E. Bowring Using Science Fiction in Teaching Artificial Intelligence AAAI Spring Symposium on Using AI to motivate greater participation in Computer Science, 2008

- [SY31] P. Paruchuri, J.P. Pearce, M. Tambe, F. Ordonez, S. Kraus An Efficient Heuristic for Security Against Multiple Adversaries in Stackelberg Games AAAI Spring Symposium on Game and Decision-Theoretic Agents, 2007
- [SY30] P. Varakantham, J. Marecki, M. Tambe, M. Yokoo SPIDER attack on a network of POMDPs: Towards quality-bounded solutions AAAI Spring Symposium on Game and Decision-Theoretic Agents, 2007
- [SY29] E. Bowring, M. Tambe, M. Yokoo Multiply constrained DCOP for distributed planning and scheduling AAAI Spring Symposium on Distributed Planning and Scheduling, 2006
- [SY28] Y. Kim, M. Tambe, P. Varakantham, R. Nair, M. Yokoo Exploiting locality of interactions in networked distributed POMDPs AAAI Spring Symposium on Distributed Planning and Scheduling, 2006
- [SY27] P. Paruchuri, M. Tambe, S. Kraus, F. Ordonez Randomizing policies for agents and agent-teams Ninth International Symposium on Artificial Intelligence and Mathematics, 2006
- [SY26] J. Pearce, R. Maheswaran, M. Tambe Solution sets for DCOPs and Graphical Games Ninth International Symposium on Artificial Intelligence and Mathematics, 2006
- [SY25] N. Schurr, J. Marecki, M. Tambe, P. Scerri, N. Kasunadhini, J.P. Lewis The Future of Disaster Response: Humans Working with Multiagent Teams (Without Being Overwhelmed) AAAI Spring Symposium on AI technologies for Homeland security, 2005
- [SY24] E. Bowring, M. Tambe Optimize My Schedule But Keep It Flexible: Distributed Multi-Criteria Negotiation for Personal Assistants AAAI Spring Symposium on Persistent Assistants, 2005
- [SY23] R. Maheswaran, J. Pearce, P. Varaktam, E. Bowring, M. Tambe Valuations of Possible Worlds (VPW): A Quantitative Framework for Analysis of Privacy Loss Among Collaborative Personal Assistant Agents AAAI Spring Symposium on Persistent Assistants, 2005
- [SY22] P. Varakantam, R. Maheswaran, M. Tambe Practical POMDPs for personal assistant domains AAAI Spring Symposium on Persistent Assistants, 2005
- [SY21] N. Schurr, M. Tambe, P. Scerri Coordination Advice: A preliminary investigation of human advice to multiagent teams AAAI Spring Symposium on Interaction Between Humans and Autonomous Systems over Extended Operation, 2004
- [SY20] H. Jung and M. Tambe Composing POMPD-based building blocks to analyze large-scale multi-agent systems AAAI Spring Symposium on Computational Synthesis From basic building blocks to high level functionality, 2003
- [SY19] R. Nair, M. Tambe and S. Marsella Integrating Belief-Desire-Intention Approaches with POMDPs: The Case of Team Oriented Programs AAAI Spring Symposium on Logical Formalisms for Commonsense Reasoning, 2003.
- [SY18] P. Scerri, D. Pynadath, L. Johnson, N. Schurr, M. Si, M. Tambe Getting robots, agents and people to cooperate: An initial report AAAI Spring Symposium on Human Interaction with Autonomous Systems in Complex Environments, 2003.

- [SY17] M. Tambe, P. Scerri, D. Pynadath Adjustable autonomy in multiagent environments In M. Barley, editors, *Invited Paper, AAAI Spring Symposium on Safe Learning*, Mar, 2002
- [SY16] R. Nair, T. Ito, M. Tambe, S. Marsella. Team formation for reformation: An extended abstract In G. Sukhatme and T. Balch, editors, *AAAI Spring Symposium on Intelligent Distributed and Embedded Systems*, Mar, 2002
- [SY15] D. Pynadath and M. Tambe Team coordination among distributed agents: Analysis of key teamwork theories and models In G. Sukhatme and T. Balch, editors, *AAAI Spring Symposium on Intelligent Distributed and Embedded Systems*, Mar, 2002
- [SY14] P.J. Modi, H. Jung, S. Kulkarni, M. Tambe, W. Shen. Dynamic distributed resource allocation In C. Tastsuolis, editor, *AAAI Fall Symposium on Negotiation methods for autonomous cooperative agents*, Nov, 2001
- [SY13] H. Jung, M. Tambe, S. Kulkarni. Argumentation as distributed constraint Satisfaction In C. Tastsuolis, editor, *AAAI Fall Symposium on Negotiation methods for autonomous cooperative agents*, Nov, 2001
- [SY12] D. Pynadath, P.Scerri, M. Tambe. MDPs for Adjustable Autonomy in Real-world Multi-agent Environments In P. Gmytrasiewicz, editor, *AAAI Spring symposium on Decision theoretic and Game theoretic agents*, March 2001
- [SY11] D. Pynadath, M. Tambe, Y. Arens, H. Chalupsky, et al. Electric Elves: Immersing an agent organization in a human organization. In K. Dautenhahn, editor, *AAAI Fall symposium on Socially Intelligent Agents — the human in the loop*, Nov 2000
- [SY10] P. Scerri, M. Tambe, H. Lee, D. Pynadath. Dont cancel my Barcelona trip: Adjusting the autonomy of agent proxies in human organizations In K. Dautenhahn, editor, *AAAI Fall symposium on Socially Intelligent Agents — the human in the loop*, Nov 2000
- [SY9] D. Pynadath, M. Tambe and N. Chauvat Rapid integration and coordination of heterogeneous distributed distributed agents for collaborative enterprises. In S. Murugesan, editor, *DARPA JFACC symposium on Advances in Enterprise Integration*, Nov, 1999
- [SY8] M. Tambe, W. Shen, M. Mataric, D. Goldberg, P.J. Modi, Z. Qiu, and B. Salemi. Teamwork in cyberspace: Using TEAMCORE to make agents team-ready. In S. Murugesan, editor, *AAAI Spring Symposium on Intelligent agents in cyberspace*, March 1999.
- [SY7] M. Tambe and Z. Qiu. Flexible negotiations in teamwork: extended abstract. In M. desJardine, editor, *AAAI FALL Symposium on Distributed Continual Planning*, November 1998.
- [SY6] G. Kaminka and M. Tambe. Social comparison. In K. Dautenhahn, editor, *AAAI FALL Symposium on Social Agents*, November 1997.
- [SY5] M. Tambe. Towards flexible teamwork in multi-agent systems. In K. Dautenhahn, editor, *AAAI FALL Symposium on Social Agents*, November 1997.
- [SY4] M. Tambe. Executing team plans in dynamic, multi-agent domains. In L. Pryor, editor, *AAAI FALL Symposium on Plan Execution: Problems and Issues*, November 1996.

- [SY3] M. Tambe, W. L. Johnson, and W. Shen. Adaptive agent tracking in real-world multi-agent domains: a preliminary report. In S. Sen, editor, *AAAI Spring Symposium on Adaptation, Coevolution and Learning in multi-agent systems*, March 1996.
- [SY2] M. Tambe, P. S. Rosenbloom, and K. Schwamb. Constraints and design choices in building intelligent pilots for simulated aircraft: Extended abstract. In H. Hexmoore, editor, *AAAI Spring Symposium on Lessons learned from implemented software architectures for physical agents*, March 1995.
- [SY1] M. Tambe, R. Jones, J. E. Laird, P. S. Rosenbloom, and K. Schwamb. Building believable agents for simulation environments. In J. Bates, editor, *AAAI Spring Symposium on Believable Agents*, 1994.

### Newsletter Publications

- [N4] F. M. DelleFave, Y. Qian, A. Jiang, M. Brown, M. Tambe Planning and Learning in Security Games In ACM SIGecom exchanges: 12.1, 2013
- [N3] B. An, J. Pita, E. Shieh, M. Tambe, C. Kiekintveld, J. Marecki GUARDS and PROTECT: Next Generation Applications of Security Games In ACM SIGecom exchanges: 10.1, 2011
- [N2] J. Pita, M. Jain, C. Kiekintveld, H. Bellamane, J. Tsai M. Tambe, F. Ordonez Security applications: Lessons from real-world deployment In ACM SIGecom exchanges: 8.2, 2009
- [N1] M. Jain, J. Pita, P. Paruchuri, M. Tambe, F. Ordonez, S. Kraus Bayesian Stackelberg games and their application at the Los Angeles International Airport In ACM SIGecom exchanges: 7.2, 2008

### Videos Accepted at Conferences

- [V2] A. Yadav, E. Rice, R. Petering, J. Craddock, B. Wilder, M. Tambe HEALER: Using AI to Raise HIV Awareness among Homeless Youth AAAI Conference 2017
- [V1] F. Fang, D. Kar, D. Thomas, N. Sintov, M. Tambe Save the Wildlife, Save the Planet: Protection Assistant for Wildlife Security (PAWS) AAAI Conference 2016

### Reprinted Papers in Edited Volumes

- [R4] M. Tambe, L. Johnson and W. Shen. Adaptive agent tracking in real-world multi-agent domains: a preliminary report. In *Readings in Agents*. Morgan Kaufmann, San Mateo, CA, 1997.
- [R3] M. Tambe, D. Kalp, A. Gupta, C.L. Forgy, B.G. Milnes, and A. Newell. Soar/psm-e: Investigating match parallelism in a learning production system. In *The Soar Papers*. MIT press, Cambridge, MA, 1993.
- [R2] M. Tambe, A. Newell and P. S. Rosenbloom. The problem of expensive chunks and its solution by restricting expressiveness. In *The Soar Papers*. MIT press, Cambridge, MA, 1993.
- [R1] M. Tambe and P. S. Rosenbloom. A framework for investigating production system formulations with polynomially bounded match. In *The Soar Papers*. MIT press, Cambridge, MA, 1993.

## **Citation Impact: h-index**

For more details, please see: <http://scholar.google.com/citations?hl=en&user=YOVZiJkAAAAJ>

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## Key Research Outcomes

### Key research outcomes: Fielded and Deployed Research, Major Influential Systems Built

- 2015 PAWS:** PAWS has been tested since 2014 in Uganda and southeast Asia for assistance in protecting endangered wildlife against poachers. PAWS generates patrol routes by solving a large-scale Stackelberg game, while taking complex geographic constraints into account, with payoff uncertainties and behavior models of poachers. PAWS is intended to be integrated into the SMART system in use by conservation agencies such as WCS, WWF and others, for use in over 600 national parks around the globe.
- 2012 TRUSTS:** TRUSTS was tested January 2012-May 2013 for randomizing schedules for the LA Sheriff's Department for fare inspection in LA's metro train system. TRUSTS solves a Stackelberg game to provide mixed strategies which allows it randomize patrols for the LA Sheriff's Department, taking into account past data on passenger load at different stations, fare evasion frequency, constraints on patrolers and schedules of trains. Further development is now with Avata Intelligence.
- 2011 PROTECT:** PROTECT was used from April 2011 to December 2017 for randomizing schedules for the US Coast Guard. PROTECT solves Stackelberg games to provide mixed strategies which allows it to randomize patrols for the US Coast Guard for protecting ports and ferries, taking into account weights of different targets and reactions potential adversaries. PROTECT is currently deployed in the ports of Boston, New York and Los Angeles/Long Beach and it is scheduled to be deployed at multiple other ports throughout the United States. PROTECT has been accredited by the US Coast Guard 2013. PROTECT is also used for patrol strategies around ferries in New York.
- 2009 IRIS:** IRIS has been deployed since October 2009 for randomizing schedules for allocation of Federal Air Marshals (FAMS) to some sectors of international flights. IRIS uses the fastest known algorithm for solving Stackelberg games to provide mixed strategies which allows it to randomize schedules for the FAMS.
- 2007 ARMOR:** ARMOR was deployed from August 2007 to August 2017 at the Los Angeles International Airport for randomization of checkpoints and canine patrols. The ARMOR system solves Bayesian Stackelberg games to provide mixed strategies to randomize schedules for the Los Angeles World Airports police.

### Key research outcomes: Patents Granted

- United States Patent 9,931,573 "Optimal patrol strategy for protecting moving targets with mobile resources". This patent covers our CASS algorithm (co-inventors: F. Fang, A. Jiang)
- United States Patent 8,364,511 and 8,195,490 "Agent Security Via Approximate Solvers". This patent covers our "ASAP or Agent Security via Approximate Policies Algorithm", which is an approximate solver for Bayesian Stackelberg Games" (co-inventors: M. Tambe, P. Paruchuri, F. Ordonez, J. P. Pearce, J. Marecki, S. Kraus)
- United States Patent 8,224,681 "Optimizing a security patrolling strategy using decomposed optimal Bayesian Stackelberg solver". This patent covers our "DOBSS or Decomposed Optimal Bayesian Stackelberg Solver" (co-inventors: M. Tambe, P. Paruchuri, F. Ordonez, J. P. Pearce, J. Marecki, S. Kraus)

**Key research outcomes: Patents Filed**

- Patent application “Optimal Strategies In Security Games” (co-inventors: M. Tambe, R. Yang, F. Ordonez, E. Shieh, B. An, Z. Yin, C. Kiekintveld), 2013 (Application number 20130273514)
- Patent application “Game theory model for patrolling an area that accounts for dynamic uncertainty” (co-inventors: M. Tambe, Z. Yin, C. Zhang, A. Jiang, S. Kraus), 2014 (Application number 20140279818)
- Patent application “Security Scheduling with Real-World Networks” (co-inventors: M. Tambe, M. Jain, V. Conitzer), 2014
- Patent application “Localized Shortest-Paths Estimation of Influence Propagation for Multiple Influencers” (co-inventors: M. Tambe, T. Nguyen, J. Tsai), 2014 (Application number 20140274246)

**Key research outcomes: Provisional Patents**

- Keeping pace with criminals: Designing patrol allocation against adaptive opportunistic criminals (co-inventors: C. Zhang, A. Sinha), 2015

**Key research outcomes: Companies Founded “Avata Intelligence”**

- *Avata Intelligence*: In 2013, I cofounded Avata Intelligence (formerly ARMORWAY Inc), a new company started based on our research, where I serve as the Director of Research, and as a member of the board of directors.

**Avata Intelligence**

*Advance your tomorrow with data-driven AI*: Avata Intelligences data analytics solutions utilize artificial intelligence (AI) to reveal to organizations exactly when, where, and how to minimize risk, allocate limited resources, and drive effective, lasting results using sophisticated AI techniques paired with the brainpower of an experienced team.

Avata Intelligence is organized as follows:

- *CEO*: Zareh Baghdasarian
- *Board of directors*: Milind Tambe, Zareh Baghdasarian, Manish Jain
- *Director of Research*: Milind Tambe
- *Tehnical leadership*: Manish Jain, James Pita

Awards and competitions won by Avata Intelligence:

- RedHerring top 100 company (2016)
- Winner, Ideas Empowered Program, USC Stevens (2013)
- Finalist, PortTech Los Angeles (2013)

Current customers include the US Coast Guard, the University of Southern California, RAND corporation and others.

More details are at [Avata.ai](http://Avata.ai).



**Key research outcomes: Centers Founded “CAIS”**

- *CAIS*: In 2016, I cofounded USC Center for Artificial Intelligence in Society (CAIS), where I serve as a co-director.

**USC Center for Artificial Intelligence in Society**

The USC Viterbi School of Engineering and the USC Suzanne Dworak-Peck School of Social Work launched the Center for Artificial Intelligence in Society (CAIS) to advance artificial intelligence research. The newly announced center, one of the first such university-based institutes dedicated to studying AI as a force for good, researchers will leverage artificial intelligence to address myriad problems ranging from climate change to security to health to homelessness.

CAIS is organized as follows:

- *Center Founding Co-directors*: Milind Tambe, Eric Rice
- *Center Operations Coordinator*: Hailey Winetrobe
- *Associate Directors*: Phebe Vayanos, Bistra Dilkina

More details are at [cais.usc.edu](http://cais.usc.edu)

## Funding as PI

Over \$34M in total funding received

### Current Research Funding

9. *Multi-Scale Network Games of Collusion and Competition*, 8/1/18-7/31/23, approx \$6,250,000, Department of Defense Multidisciplinary Research Program of the University Research Initiative; Co-Principal Investigator (own share: approx \$750K)
8. *LAG-MD: Deep learning agents and game theory for military decision making*, 1/1/19-7/1/20, approx \$1,000,000; DARPA; (Own Share: approx \$300K)
7. *Graphical Encoding of First Principles for Agent Based Social Simulation (GEPABSS)*, 12/01/17-5/31/2020, approx \$2,495,000; DARPA; Co-Principal Investigator. (Own Share: approx \$454K)
6. *Predictive Modeling for Early Identification of Suicidal Thinking in Social Networks*, 8/01/17-7/30/2020, approx \$600,000; Army Research Office; Co-Principal Investigator. (Own Share: \$200K)
5. *Realizing Cyber Inception: Towards a Science of Personalized Deception for Cyber Defense*, 8/1/17-7/31/22, approx \$6,250,000, Fiscal Year (FY) 2017 Department of Defense Multidisciplinary Research Program of the University Research Initiative; Principal Investigator
4. *Spatio-Temporal Game Theory and Real-Time Machine Learning for Adversarial Groups in the Wild*, 01/01/2017-12/31/2019, approx \$1,250,000; Office of secretary of Defense MINERVA Research Initiative; Principal Investigator.
3. *USC Center for Artificial Intelligence in Society* , 10/01/16-9/30/2019, approx \$750,000; Center Co-director
2. *Peers and Social Media to Promote HIV Testing and Treatment for Homeless Youth* , 4/01/16-3/31/20, approx \$80,000, Subcontract from UCLA (Primary: California HIV/AIDS Research Program); Principal Investigator.
1. *COMPSUSTNET: Expanding the horizons of computational sustainability*, 12/15/15-11/20/20, approx \$10M, National Science Foundation (own share \$300K)

### Past Research Funding

75. *Building a science of cybersecurity games*, 9/1/15-9/1/18, approx \$750,000, Army Research Office; Principal Investigator
74. *Multiplayer attacker-defender security games*, approx \$100K, 12/20/2017-4/20/2018; DARPA Seedling (via Lockheed Martin); USC PI.
73. *Gift to support "AI for Conservation" at USC Center for Artificial Intelligence in Society*, approx \$200K, 1/1/2018-12/31/2018 Microsoft.
72. *Gift "Using AI to Support Cognitive Task Analysis for Training" at USC Center for Artificial Intelligence in Society*, 12/15/2017-12/15/2018 approx \$320K, Schmidt Futures Foundation.

71. *Gift to support summer fellows at USC Center for Artificial Intelligence in Society*, approx \$250K, Schmidt Futures Foundation.
70. *Gift to support field study USC Center for Artificial Intelligence in Society*, approx \$25K, Individual donor (name withheld for anonymity)
69. *Playing Security Games With No Time for Mapping Full Networks: Maximizing Influence in Uncharted Social Networks* , 2/1/2017-9/1/2017, approx \$500,000; Army Research Office; Principal Investigator.
68. *Development and Enhancement of the Intelligent Randomization in Scheduling (IRIS) System* , 10/01/16-9/30/2017, approx \$550,000; Transportation Security Administration; Co-Principal Investigator. (Own Share: \$80K)
67. *Developing the Science and Applications of Security Games: Matching Learning, Uncertainty and Preference Elicitation in Game theory for Security* , 7/1/15-7/1/17, approx \$250,000, (part of the USC center for excellence award from the department of homeland security)); Principal Investigator
66. *UCAR Cooperative Agreement Program on Atmospheric Effects, Analysis, Prediction*, 8/15/14-7/1/17, approx \$393,500, Naval Research Laboratory; Principal Investigator.
65. *USC Resource Center for Minority Aging Research (RCMAR)*, 9/1/12-6/1/17, approx \$114,000, Mentor
64. *SEP: Creating An Energy Literate Society Of Humans, Buildings, And Agents For Sustainable Energy Management*, 8/16/12-8/15/17, approx \$1,550,00, National Science Foundation; Co-Principal Investigator (own share 500K).
63. *Scalable, Stochastic and Spatiotemporal Game Theory for Real-World Human Adversarial Behavior*, 6/1/11-8/31/17, approx \$6,250,000, Fiscal Year (FY) 2011 Department of Defense Multidisciplinary Research Program of the University Research Initiative; Principal Investigator
62. *Dynamic Aviation Risk Management Solution (DARMS): Research Study to Demonstrate a Proof-of-Concept*, 09/29/15-09/28/16, approx \$800,000, Department of Homeland Security; Co-Principal Investigator (own share 400K).
61. *Workshop on Adaptive Defense in the Cyber-Security Domain*, 01/15/2016-05/15/2016, approx \$7500, Army Research Office; Principal investigator
60. *Game theory for security: Large-scale data-driven approaches*, 7/1/14-7/1/15, approx \$400,000, (part of the USC center for excellence award from the department of homeland security)); Principal Investigator
59. *Dynamic Aviation Risk Management System (DARMS)*, 8/15/14-2/15/15, approx \$100,000, Transportation Security Administration; Principal Investigator
58. *Workshop on wildlife crime: An interdisciplinary perspective*, 6/15/14-12/15/14, approx \$20,000, Army Research Office; Principal Investigator
57. *ARMOR FISH: Game theory for protecting fisheries*, 8/15/13-11/30/14, approx \$185,000, US Coast Guard Research and Development Center; Principal Investigator

56. *Game theoretic randomization with applications to Federal Air Marshals (FAMS) IV*, 10/1/11-7/1/14, approx \$250,000, Federal Air Marshals Service; Principal Investigator
55. *Scheduling Security Activities in Uncertain Adversarial Domains*, 7/1/11-7/1/14, approx \$360,00 (part of the USC center for excellence award from the department of homeland security)); Principal Investigator
54. *Game theory and human behavior*, 7/1/10-7/1/16, approx \$120,000, from USC Research collaboration fund; Principal Investigator
53. *Towards smarter government and smarter cities: Computational game theory for public safety and welfare*, 11/1/12-11/1/13, approx \$20,000, IBM Award; Principal Investigator
52. *USC Steven's Center for Innovation Ideas Empowered Program*, 15/1/13-15/6/13, approx \$80,000, Funding for Avata Intelligence startup; Principal Investigator
51. *ARMOR-Metro: Towards Optimal Use of Limited Security Resources for Randomized Patrols for Public Transit Systems*, 8/28/12-2/28/14, approx \$500,000, Transportation Security Administration; Principal Investigator
50. *ARMOR-PROTECT-NY Prototype model development*, 8/16/11-12/15/13, approx \$466,000, US Coast Guard Research and Development Center; Principal Investigator
49. *PROTECT Transition Support to the US Coast Guard RDC Modeling AND Simulation CENTER OF EXCELLENCE*, 8/16/12-9/15/13, approx \$200,000, US Coast Guard Research and Development Center; Principal Investigator
48. *Towards Algorithmic Advances for Solving Stackelberg games: Addressing Model Uncertainties and Massive Game Scale-up*, 4/15/10-4/15/13, approx \$360,000 Army Research Office; Principal Investigator
47. *Task allocation using continuous resource distributed markov decision processes*, 9/1/11-8/31/13, approx \$132,000, NASA Space Technology Research Fellowships (NSTRF); Principal Investigator
46. *Automated Threat Assessment and Course of Action Analysis*, 4/20/12-9/15/12, approx \$30,000, sub-contract from Raytheon
45. *Scheduling Border Security Operations in Uncertain Adversarial Domains*, 9/15/10-9/15/12, approx \$175,000 (via the Univ of Texas El Paso NCBSI center from the department of homeland security)
44. *Workshop on Populations & Crowds: Dynamics, Disruptions and their Computational Models*, 8/16/12-12/15/12, approx \$24,00, Army Research office; Principal Investigator
43. *Dynamic Agent-Based Reallocation and Tasking (DART)*, 5/15/12-11/15/12, approx \$12,000, sub-contract from Perceptronics Solutions, Principal Investigator (Part of Air Force SBIR, Phase I)
42. *Cancer as a Dynamic Stochastic Graphical-Game*, 7/1/10-8/1/12, approx \$120,000, from MC-START (Multiscale Complex Systems Transdisciplinary Analysis of Response to Therapy) PSOC (Physical Sciences-Oncology Center)

41. *Game theoretic randomization with applications to Federal Air Marshals (FAMS) III*, 10/1/11-7/1/12, approx \$115,000 (via the Rutgers CCICADA center from the Federal Air Marshals Service)
40. *Enhancing ARMOR at the Los Angeles International Airport*, 6/1/11-6/1/12, approx \$25,000, Los Angeles World Airports
39. *Adaptive Team Training*, 9/1/09-1/31/12, approx \$45,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of Army SBIR, Phase II)
38. *Distributed Automated Planning System (DAPS) for a Dynamic Collection of Heterogeneous Manned and Unmanned Entities*, 9/1/09-2/28/12, approx \$185,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of Army SBIR, Phase II)
37. *Automated Mission Scheduling using Distributed Constraint Optimization*, 6/1/08-12/1/11, approx \$87,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of DARPA STTR, Phase II)
36. *Automated Threat Assessment and Suspicious Activity Detection*, 5/1/11-12/1/11, approx \$50,000, subcontract from Raytheon
35. *Multi-Agent Simulation and Causal Model (MSCM) System for Enhancing Team Cognitive Readiness*, 6/1/11-12/1/11, approx \$20,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of OSD SBIR 010-CR7, Phase I)
34. *Game-theoretic randomization with applications to coast guard problems*, 5/1/10-3/1/11, approx \$75,000 (via the USC center for excellence award from the department of homeland security)
33. *Game theoretic randomization with applications to Federal Air Marshals (FAMS) II*, 5/1/10-7/1/11, approx \$150,000 (via the Rutgers CCICADA center from the department of homeland security)
32. *Multi Agent Autonomous Reasoning System (MAARS) for Satellite Defense*, 2/1/10-9/1/10, approx \$27,500, subcontract from Perceptronics Solutions, Principal Investigator (Part of DARPA SBIR, Phase I)
31. *Game theory for security*, 9/1/07-9/1/10, approx \$470,000 (part of the USC center for excellence award from the department of homeland security)
30. *Game-theoretic randomization with applications to transportation security*, 7/1/09-7/1/10, approx \$225,000 (via the USC center for excellence award from the department of homeland security)
29. *Multiagent Adjustable Autonomy Framework (MAAF) to Support Multi-robot, Multi-Human Teams*, 5/1/08-5/1/10, approx \$250,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of DARPA STTR, Phase II)
28. *Rapid formation of virtual organizations using modeling and multiagent systems*, 2/1/08-2/1/10, approx \$243,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of DARPA STTR, Phase II)
27. *Game theoretic randomization with applications to Federal Air Marshals (FAMS)*, 5/1/08-9/1/09, approx \$250,000 (via the USC center for excellence award from the department of homeland security)

26. *Automated Planning Software For a Dynamic Heterogeneous Collection Of Manned And Unmanned Entities*, 1/1/09-6/1/09, approx \$30,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of Army SBIR, Phase I)
25. *Distributed constraint optimization for mobile sensor nets*, 1/1/08-2/28/09, approx \$100,000, Subcontract from Lockheed Martin Advanced Technology Laboratory (DARPA "LANDROIDS" program).
24. *Smart oil apprentice*, 5/1/08-12/31/08, approx \$100,000, subcontract from Center for Interactive and Smart Oil field Technologies (PI Prof. Raghu Raghavendra)
23. *Cultivating Interdisciplinary Technology Innovation*, 1/1/08-7/1/08, approx \$10,000, Zumberge Interdisciplinary Grant from the James H. Zumberge Research and Innovation Fund.
22. *Automated Mission Scheduling by Distributed Constraint Optimization for Collaborative and Shared Control of Unmanned Vehicle Systems*, 3/1/07-12/1/07, approx \$18,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of DARPA SBIR, Phase I)
21. *Multiagent Adjustable Autonomy Framework (MAAF) to Support Multi-robot, Multi-Human Teams*, 12/1/06-12/1/07, approx \$45,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of DARPA STTR, Phase I)
20. *Rapid formation of virtual organizations using modeling and multiagent systems*, 10/1/06-10/1/07, approx \$45,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of DARPA STTR, Phase I)
19. *Multiagent simulations of disaster rescue*, 4/1/04-8/1/07, approx \$450,000 (part of the USC center for excellence award from the department of homeland security)
18. *Team composition optimization tools*, 12/1/06-7/1/07, approx \$12,000, subcontract from Perceptronics Solutions, Principal Investigator (Part of DARPA STTR, Phase I)
17. *Coordinators: Intelligent coordination support for humans*, 2/15/05-6/30/07, approx \$450,000, subcontract from Honeywell Research, Principal Investigator (Part of DARPA's COORDINATOR program)
16. *Enduring teams of cognitive personal assistants*, 5/1/03-9/31/06, approx \$1,390,000, Subcontract from SRI International, Principal investigator (Part of DARPA's CALO "personal assistant" project)
15. *COM-MTDP: A new approach for analysis of multiagent teamwork*, 8/1/02-7/31/06, approx. \$315,000, National Science Foundation (NSF). Principal Investigator.
14. *Continual coherent team planning*, 6/1/2001-9/1/2004, Approx \$300,000. NASA NRA subcontract from the Jet Propulsion Lab. Principal Investigator.
13. *Large-scale agent-facilitated human organizations*, 9/1/03-9/1/04, approx \$10,000, Okawa foundation research grant
12. *Software for distributed robot teams*, 8/1/02-3/1/04, approx \$400,000 Subcontract from SAIC. Co-principal investigator (with Dr. Gaurav Sukhatme)

11. *RAP Team*, 7/1/02-12/31/02, approx \$400,000, Defense Advanced Research Project Agency (DARPA). Co-principal investigator (with Dr. Paul Rosenbloom, Dr. Lewis Johnson and Dr. Gaurav Sukhatme).
10. *Extending the ADOPT Algorithm*, 1/1/03-5/1/03 approx \$20,000 Defense Advanced Research Project Agency (DARPA) Principal Investigator.
9. *DYNAMITE: Dynamic Negotiating Adaptive Multi-agent Teams*, 6/1/99-5/1/03, approx. \$1,000,000. Defense Advanced Research Projects Agency (DARPA). Principal Investigator.
8. *TEAMCORE: Rapidly extending and building agents for flexible, adaptive teamwork*, 7/1/98-6/1/2002, approx. \$2,038,000, Defense Advanced Research Projects Agency (DARPA). Principal Investigator.
7. *Investigating teamwork among spacecraft*, 7/1/2001-12/1/2001, Approx \$50,000. Subcontract from the NASA AMES research center. Co-Principal Investigator (with Dr. Stacy Marsella).
6. *PSYCHSIM: Psychological operations impact analysis*, 7/1/2001-3/1/2002, Approx \$160,000. Subcontract from the Institute for Defense Analysis (IDA). Co-principal investigator (with Dr. Stacy Marsella).
5. *Modeling and analysis of team behavior in multi-agent worlds*, 7/1/98-10/1/2001, approx. \$240,000, Gift from Intel corporation. Co-principal investigator (with Dr. Stacy Marsella).
4. *Towards flexible teamwork in complex, dynamic environments*, 9/1/97-5/1/01, approx. \$250,000, National Science Foundation (NSF). Principal Investigator.
3. *Teaming and information sharing among adaptive battlefield agents*, 7/8/97-9/1/00, approx. \$900,000. Air-force office of scientific research (AFOSR). Co-Principal Investigator (with Dr. Wei-Min Shen).
2. *Towards Free Flight: The Airborne Joint Intentions network*, 7/1/98-12/1/98, approx. \$45,000, Subcontract from Boeing corporation. Principal investigator.
1. *Adaptive Agent and Agent-Group Modeling*, 1/1/97-6/30/98, approx. \$100,000 Subcontract from Sverdrup Technology, Inc. Principal Investigator.

## Teaching and Education I: Students, Thesis Committees

### Past Students and Post-doctoral Researchers

[30 PhD, 11 Post-doctoral students have completed their training under my mentorship; most in Computer Science and those not in CS are labeled as such]

### Past PhD Students

30. **Dr. Sara Marie Mc Carthy**, PhD defended: 8/2018

- Thesis title “Hierarchical planning in security games: A game theoretic approach to strategic, tactical and operational decision making”
- Current (or last update) position after PhD: Google

29. **Prof. Haifeng Xu**, PhD defended: 5/2018 (joint with Prof. Shaddin Dughmi)

- Thesis title “Information as A Double-Edged Sword in Strategic Interactions”
- *Best Research Assistant for academic year 2016-2017*, Computer Science Department, University of Southern California
- Google PhD Fellowship 2017-2018
- CAMS (Center for Applied Mathematics) Prize 2017
- Current (or last update) position after PhD: Assistant Professor, Computer Science Department, University of Virginia

28. **Dr. Aaron Schlenker**, PhD defended: 5/2018

- Thesis title “Game Theoretic Deception and Threat Screening for Cyber Security”
- Current (or last update) position after PhD: Apogee Inc

27. **Prof. Amulya Yadav**, PhD defended: 4/2018

- Thesis title “Artificial Intelligence for Low Resource Communities: Influence Maximization in an Uncertain World”
- *Best Research Assistant for academic year 2016-2017*, Computer Science Department, University of Southern California
- Current (or last update) position after PhD: Assistant Professor, Information Sciences and Technology, Pennsylvania State University

26. **Dr. Benjamin Ford**, PhD defended: 7/2017

- Thesis title “Real world evaluation and deployment of wildlife crime prediction models”
- Current (or last update) position after PhD: Aptima

25. **Dr. Debarun Kar**, PhD defended: 4/2017

- Thesis title “When AI Helps Wildlife Conservation: Learning Adversary Behavior in Green Security Games”



- Current (or last update) position after PhD: Goldman Sachs Machine Learning
24. **Dr. Yasaman Dehghani Abbasi**, PhD defended: 5/2016 (Industrial and Systems Engineering)
- Thesis title “Modeling Human Bounded Rationality in Opportunistic Security Games”
  - Current (or last update) position after PhD: Qualcomm
23. **Dr. Yundi Qian**, PhD defended: 4/2016
- Thesis title “Handling Attacker’s Preference in Security Domains: Robust and Learning Approaches”
  - Current (or last update) position after PhD: Google
22. **Prof. Fei Fang**, PhD defended: 4/2016
- Thesis title “Towards Addressing Spatio-Temporal Aspects in Security Games”
  - WiSE merit fellowship 2014
  - *Best Research Assistant for academic year 2015-2016*, Computer Science Department, University of Southern California
  - *William F. Ballhaus, JR. Prize for Graduate Engineering Research* for best PhD thesis in The USC Viterbi School of Engineering
  - *Best PhD thesis for academic year 2016-2017*, Computer Science Department, University of Southern California
  - Current (or last update) position after PhD: Assistant Professor, School of Computer Science, Carnegie Mellon University
21. **Dr. Chao Zhang**, PhD defended: 4/2016
- Thesis title “Opportunistic Crime Security Games: Assisting Police to Control Urban Crime Using Real World Data ”
  - Current (or last update) position after PhD: Google
20. **Prof. Thanh Hong Nguyen**, PhD defended: 4/2016
- Thesis title “Combating Adversaries under Uncertainties in Real-world Security Problems: Advanced Game-theoretic Behavioral Models and Robust Algorithms”
  - WiSE merit fellowship 2015
  - Current (or last update) position after PhD: Assistant Professor, Computer Science, University of Oregon
19. **Prof. Leandro Marcolino**, PhD defended: 3/2016
- Thesis title “Three Fundamental Pillars of Decision-Centered Teamwork”
  - *Best Research Assistant for academic year 2014-2015*, Computer Science Department, University of Southern California
  - *Best PhD thesis for academic year 2015-2016*, Computer Science Department, University of Southern California

- Current (or last update) position after PhD: Tenure track Lecturer, Computer Science Department, Lancaster University, UK

18. **Dr. Matthew Brown**, PhD defended: 5/2015

- Thesis title: “Balancing Tradeoffs in Security Games: Handling Defenders and Adversaries with Multiple Objectives”
- DHS PhD fellowship from CREATE homeland security center 2013-2015
- NASA PhD fellowship 2011-2013
- Current (or last update) position after PhD: Scientist, Avata Intelligence Inc

17. **Dr. Eric Shieh**, PhD defended: 2/2015

- Thesis title: “Not a lone ranger: Unleashing defender teamwork in security games”
- DHS PhD fellowship from CREATE homeland security center 2013-2015
- Current (or last update) position after PhD: Senior Member, Lockheed Martin Advanced Technology Lab

16. **Dr. Rong Yang**, PhD defended: 4/2014

- Thesis title: “Human Adversaries in Security Games: Integrating Models of Bounded Rationality and Fast Algorithms”.
- *Honorable mention: Best PhD thesis for academic year 2013-2014*, Computer Science Department, University of Southern California
- IBM PhD fellowship 2013-2014
- *Best Research Assistant for academic year 2012-2013*, Computer Science Department, University of Southern California
- USC Viterbi PhD fellowship 2009-2010
- Current (or last update) position after PhD: Software engineer, YouTube

15. **Dr. JunYoung Kwak**, *Phd defended: 11/2013*

- Thesis title: “The Power of Flexibility: Autonomous Agents That Conserve Energy in Commercial Buildings”.
- USC Annenberg graduate fellowship 2008-2010
- Current (or last update) position after PhD: Senior software engineer, Spokeo Systems.

14. **Dr. Jason Tsai**, *PhD defended: 4/2013*

- Thesis title: “Protecting Networks Against Diffusive Attacks: Game-Theoretic Resource Allocation for Contagion Mitigation”.
- DHS PhD fellowship from CREATE homeland security center 2010-2013
- USC Annenberg graduate fellowship 2008-2010
- Currently: Research scientist, Rocketfuel.

13. **Dr. Manish Jain**, *PhD defended: 4/2013*

- Thesis title: “Thwarting adversaries with unpredictability: Massive-scale Game-Theoretic Algorithms for Real-world Security Deployments”.
- *Victor Lesser Distinguished Doctoral Dissertation Award 2013*, International Foundation for Autonomous Agents and Multiagent Systems (IFAAMAS), Keynote at AAMAS’14
- *Best PhD thesis for academic year 2012-2013*, Computer Science Department, University of Southern California
- *Best Research Assistant for academic year 2011-2012*, Computer Science Department, University of Southern California
- Currently: CTO, Avata Intelligence.

12. **Dr. Zhengyu Yin**, *PhD defended: 3/2013*

- Thesis title: “Addressing Uncertainty in Stackelberg Games for Security: Models and Algorithms”.
- *Best Research Assistant for academic year 2012-2013*, Computer Science Department, University of Southern California
- Current (or last update) position after PhD: associate, DE Shaw.

11. **Dr. James Pita**, *PhD defended: 9/2012*

- Thesis title: “The human element: Addressing human adversaries in security domains”.
- DHS PhD fellowship from CREATE homeland security center 2009-2012
- USC Annenberg graduate fellowship 2007-2009
- Current (or last update) position after PhD: Chief Technology Innovation Officer, Avata Intelligence

10. **Dr. Janusz Marecki**, *PhD defended: 5/2008*

- Thesis title: “Planning with continuous resources in agent systems”.
- Current (or last update) position after PhD: research scientist, Google Deepmind.

9. **Dr. Nathan Schurr**, *PhD defended: 10/2007*

- Thesis title: “Towards Human-Multiagent Teams”.
- DHS PhD fellowship from CREATE homeland security center 2005-2006
- Current (or last update) position after PhD: research scientist, Aptima Inc.

8. **Prof. Emma Bowring**, *PhD defended: 7/2007*

- Thesis title: “Balancing local constraints and global goals in multiply-constrained distributed constraint optimization”.
- Outstanding teaching assistant award, Center for Excellence in Teaching, University of Southern California 2007

- Special award for co-designing and co-developing a new course “Intelligent agents and science fiction” 2006
- Current (or last update) position after PhD: Associate Professor, Computer Science Department, University of the Pacific.

7. **Dr. Jonathan Pearce**, *PhD defended: 5/2007*

- Thesis title: “Local optimization in cooperative agent networks”.
- *Best Research Assistant for academic year 2006-2007*, Computer Science Department, University of Southern California
- Current (or last update) position after PhD: Analyst, Knight capital, New York.

6. **Dr. Praveen Paruchuri**, *PhD defended: 4/2007*

- Thesis title: “Keep the adversary guessing: Agent security by policy randomizing”
- Current (or last update) position after PhD: Associate Professor, IIT-Hyderabad, India.

5. **Prof. Pradeep Varakantham**, *PhD defended: 2/2007*

- Thesis title: “Towards efficient planning for real world partially observable domains”
- *Best Research Assistant for academic year 2005-2006*, Computer Science Department, University of Southern California
- Current (or last update) position after PhD: Assistant Professor, School of Information Systems, Singapore Management University.

4. **Dr. Ranjit Nair**, *PhD defended: 8/2004*

- Thesis title “Coordinating multiagent teams in uncertain domains using distributed POMDPs”.
- Current (or last update) position after PhD: founder and chief executive officer “GerminAIT”, to germinate AI technologies, Mumbai, India.

3. **Dr. Hyuckchul Jung**, *PhD defended: 9/2003*

- Thesis title “Conflict resolution strategies and their performance models for large-scale multiagent systems”.
- Current (or last update) position after PhD: research scientist at Interactions Corporations.

2. **Prof. Pragnesh Jay Modi**, *PhD defended: 6/2003*

- Thesis title “Distributed constraint optimization in multiagent systems”.
- Formerly, assistant Professor, Computer Science, Drexel University (Co-advisor: Dr. Wei-min Shen). [deceased; the best student award at the International Joint Conference on Autonomous Agents and Multiagent systems is now named as the Pragnesh Jay Modi best student paper award.]

1. **Prof. Gal Kaminka**, *PhD defended: 5/2000*

- Thesis title: “Execution monitoring in multi-agent environments”.
- Current (or last update) position after PhD: Professor, Computer Science, Bar-Ilan University, Israel.

**Past postdoctoral researchers and research scientists**

11. **Arunesh Sinha**, Postdoctoral Research Associate, 8/15/14 -8/15/16
  - Current (or last update) position after PhD: Research Scientist, University of Michigan EECS
10. **Dr. Matthew Brown**, Postdoctoral Research Associate, 6/1/15-5/30/15
  - Current (or last update) position after PhD: Scientist, Avata Intelligence Inc
9. **Dr. Francesco Delle Fave**, Postdoctoral Research Associate, 11/15/12-11/15/14
  - Current (or last update) position after Postdoc: Research Scientist, Disney Research Boston
8. **Prof. William B. Haskell**, Postdoctoral Research Associate, 6/1/13-6/1/14
  - Current (or last update) position after Postdoc: Assistant Professor, National University of Singapore
7. **Prof. Albert Xin Jiang**, Postdoctoral Research Associate, 11/1/11-5/24/14
  - Current (or last update) position after Postdoc: Assistant Professor, Trinity University, Texas
6. **Prof. Bo An**, Postdoctoral Research Associate, 10/1/10-6/15/12
  - Current (or last update) position after Postdoc: Assistant Professor, Nanyang Technological University, Singapore
5. **Prof. Matthew E. Taylor**, Post-doctoral research associate, 8/15/08-7/1/10
  - Current (or last update) position after Postdoc: Assistant Professor at the Computer Science Department at Washington State University
4. **Prof. Christopher Kiekintveld**, Post-doctoral research associate, 6/15/08-7/1/10
  - Current (or last update) position after Postdoc: Assistant Professor at the Computer Science Department at University of Texas at El Paso
3. **Prof. Rajiv Maheswaran**, Post-doctoral research associate, 8/15/03-7/1/05
  - Current (or last update) position after Postdoc: Research Assistant Professor at the Computer Science Department at USC
  - Project leader at the Information Sciences Institute, University of Southern California
2. **Prof. Paul Scerri**, Post-doctoral research associate, 7/1/01-7/1/03
  - ,Current (or last update) position after Postdoc: Associate Research Professor at the Robotics Institute, Carnegie Mellon University
1. **Dr. David Pynadath**, Computer Research Scientist, 12/1/98-7/1/02
  - Current (or last update) position after Postdoc: Research Scientist at the Institute for Creative Technology, University of Southern California

**Past Masters Students and their Research Projects**

33. **Donnabell Dmello**, MS student, 8/15/16 - 12/31/17 “Detecting wildlife in infrared videos with deep learning”
32. **Venil Noronha**, MS student, 8/15/16 - 12/31/17 “Detecting wildlife in infrared videos with deep learning”
31. **Rajni Kumari**, MS student, 10/15/16 - 12/31/17 Webmaster
30. **Vivek Tiwari**, MS student, 5/15/16 - 5/15/17 Webmaster
29. **Amit Plaha**, MS student, 1/15/15 - 5/15/16 “App for HIV intervention in real world settings”
28. **Sumukh Lagadamane-Shivashankara**, MS student, 1/15/16 - 5/15/16 Webmaster
27. **Andrew Plucker**, MS student, 5/15/15 - 12/15/15 “The Future of Counterinsurgency Modeling: Decision Aids for United States Army Commanders”
26. **Nirupama Vaidyanathan**, MS student, 8/15/15 - 12/15/15 Webmaster
25. **Prerna Totla**, MS student, 8/15/14 - 5/15/15 “Human Subject Experiments on Opportunistic Crime and Green Security”
24. **Mahek Jasani**, MS student, 5/15/14-12/15/14 “Human Subject Experiments for Fair Division”
23. **Soudhamini Radhakrishnan**, MS student, 5/15/14 -8/15/14 “Human Subject Experiments for Graph interdiction”
22. **Jie Zheng**, MS Student, 5/15/13-5/15/14 “Wildlife security and poaching”
21. **Rishika Agarwal**, MS Student, 1/15/13-5/15/13 “Behavior game theory”
20. **Mayuresh Janorkar**, MS student, 1/15/12-1/15/13 “Behavioral game theory”
19. **You Zhou**, MS student, 5/12/12-5/15/13 “Game-theoretic randomization for the Federal Air Marshals Service”
18. **Ripple Goyal**, MS student, 9/12/12-5/15/13 “ARMOR-LAX”
17. **Parth Shah**, MS student, 5/15/11-5/15/12 “Game-theoretic randomization for the Federal Air Marshals Service”
16. **Mohit Goenka**, MS student, 5/15/10-5/15/11 “Game theory and security: for the Transportation Security Administration”
15. **Mufaddal Jhaveri**, MS student, 11/1/10-5/1/11 “Game-theoretic randomization for the Federal Air Marshals Service”
14. **Bharatkumar Patel**, MS student, 7/15/09-5/1/10 “Game-theoretic randomization for the Transportation Security Administration”
13. **Harish Bellamane**, MS student, 2/1/09-5/15/10 “Game-theoretic randomization for the Federal Air Marshals service”

12. **Atul Kumar**, MS student, 8/25/08-8/1/09 “K-optimal and t-distance optimal algorithms”
11. **Shyamsundar Rathi**, MS student, 7/1/08-5/15/09 “Randomized Allocation for the Federal Air Marshals”
10. **Tapana Gupta**, MS student, 9/1/05-12/31/07 “Networked distributed POMDPs”
9. **Ankit Modi**, MS student, 9/1/06-5/31/07 “Robust implementation of multiply constrained DCOPs”.
8. **Yoonheui Kim**, MS student, 1/1/05-5/1/06 “Exploiting Locality of Interaction in Networked Distributed POMDPs: AN EMPIRICAL EVALUATION”
7. **Rahul Iyer**, MS student, 12/1/04-12/1/05 “Speeding up DCOP algorithm ADOPT via Preprocessing”
6. **Don Dini**, 9/1/04-5/1/05, MS Thesis title “Advantages of unpredictable multiagent systems: Randomized policies for single agents and agent teams”,
5. **Steven Okamoto**, 9/1/03-6/1/04, MS Thesis title “Distributed constraint optimization in LA: Relaxed”. *Chair’s excellence award for his MS thesis*
4. **Syed Muhammed Raza Ali**, 1/1/03-9/1/04, Research project “Preprocessing for Distributed Constraint Optimization in the ADOPT algorithm”.
3. **Shriniwas Kulkarni**, 6/1/00-8/1/01. Research project “Applying DisCSPs in Distributed sensor nets”.
2. **Taylor Raines**, 9/1/98-5/1/2000. Research project “ISAAC Soccer analyst for RoboCup”.
1. **Zhun Qiu**, 9/1/97-12/31/98. Research project “Multiagent Negotiation by Argumentation”.

#### Past Undergraduate research students

14. Nikhil Cherukuri, 8/15/15-8/15/17 “Game theory and behavior modeling”
13. **Dana Thomas**, 8/15/14-8/15/16 “Game theory and human behavior”
12. **Matthew Burke**, 8/15/15-8/15/16 “Game theory and wildlife security”
11. **Brian Schwedock**, 8/15/15-8/15/16 “Game theory and wildlife security”
10. **Providence Illesvich**, 5/15/14-9/15/14, “Game theory and wildlife security”
9. **Douglass Chen**, 9/1/12-5/15/13 “Multiagent Go”.
8. **Andrew Deeds**, 9/1/10-1/1/13 “PROTECT – Decision aid for the US Coast Guard”.
7. **Shira Esptein**, 1/1/09-5/1/21 “ESCAPES - Multiagent Evacuation Simulation”.
6. **Andrew Ogden**, 2/1/09-12/15/10 “ESCAPES - Multiagent Evacuation Simulation”.
5. **Prateek Tandon**, 9/1/08-5/15/10 “Applying DCEE (distributed coordinated exploration and exploitation) framework on CREATE robots”.

4. **Michael Scott**, 7/1/09-5/1/10 “GUARDS: Game theory for security”
3. **Craig Western**, 9/1/07-5/15/10 “ARMOR, IRIS, GUARDS: Game theory for security”
2. **Christopher Portway**, 5/15/07-5/15/08 “ARMOR randomization for airport security”.
1. **Matt Mehne**, Undergraduate student, 1/1/04-5/1/04. “Machinetta proxies multiagent teamwork”



**Current Research Group****Post-doctoral Research Associates**

1. **Andrew Perrault**, 10/1/18-

**PhD Students**

13. **Shahrzad Gholami**, PhD student, 1/1/15-
  - USC Annenberg Graduate Fellowship 2014-2016
12. **Bryan Wilder**, PhD student, 8/1/15-
  - USC Provost Fellowship 2015-2017
  - NSF Graduate Research Fellowship
11. **Elizabeth Bondi**, PhD student, 8/1/16-
10. **Aida Rahmattalabi**, PhD student, 8/1/16- (Joint with Prof. P. Vayanos)
9. **Sarah Cooney**, PhD student, 8/1/17-
8. **Han Ching Ou**, PhD student, 8/1/17-
  - USC Annenberg Graduate Fellowship 2016-2018
7. **Kai Wang**, PhD student, 8/1/17-
6. **Omkar Thakur**, PhD student, 8/1/17- (Joint with Prof. P. Vayanos)
5. **Elizabeth Ondula**, PhD student, 8/1/18- (Joint with Prof. B. Raghavan)
  - USC Annenberg Graduate Fellowship 2016-2018
4. **Aditya Mate**, PhD student, 8/1/18- (Joint with Prof. B. Dilkina)
3. **Lily Xu**, PhD student, 8/1/18- (Joint with Prof. B. Dilkina)
2. **Jackson Killian**, PhD student, 8/1/18- (Joint with Prof. B. Dilkina)
1. **Eric Ewing**, PhD student, 8/1/18- (Joint with Prof. B. Dilkina)

**MS Students**

- **Samarth Kulkarni**, MS student, 5/15/17 -
- **Prachi Jhanwar**, MS student, 5/15/17 -
- **Laksh Matai**, MS student, 5/15/17-

**Participation in Thesis committees: External to USC**

- *David Gray Grant*, PhD thesis committee (2018), Philosophy Department, MIT
- *Rob Lass*, PhD thesis committee (2014), Computer Science Department, Drexel University
- *Adam Eck*, PhD thesis committee (2014), Computer Science Department, University of Nebraska-Lincoln
- *Joseph Zemlin*, MS thesis committee (2014), National University
- *Arlette van Wissen*, PhD thesis committee (2013), Computer Science, Vrije University, Amsterdam, The Netherlands.
- *Anuresh Sinha*, PhD thesis committee (2013), School of Computer Science, Carnegie Mellon University.
- *Daniel Hennes*, PhD thesis committee (2013), Dept of Knowledge Engineering, Maastricht University, Maastricht, The Netherlands.
- *Jens PFau*, PhD thesis committee (2012), Computer Science, the University of Melbourne, Australia.
- *Natalie van der Waal*, PhD thesis committee (2012), Computer Science, Vrije University, Amsterdam, The Netherlands.
- *Dmytro Korzhyk*, PhD thesis committee (2011), Computer Science, Duke University.
- *Steven Okamoto*, PhD thesis committee (2008), School of Computer Science, Carnegie Mellon University.
- *Maayan Roth*, PhD thesis committee (2007), School of Computer Science, Carnegie Mellon University.
- *Rachel Greentstadt*, PhD thesis committee (2007), Computer Science Department, Harvard University.
- *Gita Sukhtankar*, PhD thesis committee (2007), School of Computer Science, Carnegie Mellon University.
- *Patrick Reily*, PhD thesis committee (2005), School of Computer Science, Carnegie Mellon University.
- *Sanjeev Kumar*, PhD thesis committee (2005), Oregon Graduate Institute.
- *Gerardo Simari*, MS thesis committee (2004), Universidad Nacional del Sur, Argentina.
- *Alessandro Farinelli*, PhD thesis committee (2004), Univerista di Roma “La Sapienza”, Italy.
- *Silvia Coradeschi*, Licenciate thesis committee *opponent* (1997), Computer Science Department, Linkoping University, Sweden.
- *Anurag Acharya*, PhD thesis committee (1993), School of Computer Science, Carnegie Mellon University.
- *C.J. Paul*, PhD thesis committee (1993), Electrical and Computer Engineering, Carnegie Mellon University.

## Participation in PhD Thesis committees: Internal to USC

### As Chair, in reverse chronological order

**Computer Science** (-2016) Shahrzad Gholami, Bryan Wilder, Aaron Schlenker, Sara Mc Carthy, Benjamin Ford, Amulya Yadav, Haifeng Xu (co-chair), Debarun Kar (*my 25th PhD student*), Yundi Qian, Chao Zhang, Fei Fang, Leandro Soriano Marcolino, Thanh Nguyen (2015-2010) Matthew Brown, Eric Shieh, Rong Yang, Jun Kwak, Jason Tsai, Zhengyu Yin, James Pita, Manish Jain, (2009-2004) Janusz Marecki, Jonathan Pearce, Pradeep Varakantham, Emma Bowring, Nathan Schurr, Praveen Paruchuri, Ranjit Nair, (2003-) Pragnesh Jay Modi, Hyuckchul Jung, Gal Kaminka (*my first PhD student in CS*)

**Industrial and Systems Engineering** (2015-) Yasaman Abbasi

### As a committee member, in reverse chronological order

**Computer Science** (-2016) Michael Tsang, Zahara Nazari, Mohamad Asghari (2015-2010) Eunkyung Kim, Megha Gupta, Hossein Tajalli, Jina Lee, Jonathan Ito, Celso De Melo, Harris Chiu, Mahyar Salek, Maros Vieria, Po-An Chen, William Yeoh, (2009-2004) Feili Hou, Sudeep Gandhe, Antonio Roque, Mei Si, Xuegeng Song, Jordan Melzer, Boyoon Jung, (2003-) Yaser Al-Onaizan, Brian Gerkey, Dani Goldberg, Bonghan Cho, Chun-nan Hsu

**Industrial and Systems Engineering** (-2004) Ye Wang, Li Zhao

**EE Department** (-2015) Daphney-Stavroula Zois

**Chemical Engineering Department** (-2017) Sohail Soltani

**Public Policy** (2013) Erroll Southers

**Psychology** (2015-2010) Jinshu Cui, Jennifer Rose Talevich

**Social work** (-2017) Joshua Rusow

## Participation in MS Thesis committees: Internal to USC

- *Andrew Plucker*, Chair, MS thesis committee (2015), Industrial Systems Engineering Department.
- *Mohit Goenka*, Chair, MS thesis committee (2009) Computer Science Department.
- *Yoonheui Kim*, Chair, MS thesis committee (2006) Computer Science Department.
- *Don Dini*, Chair, MS thesis committee (2004) Computer Science Department.
- *Steven Okamoto*, Chair, MS thesis committee (2003), Computer Science Department.

## Teaching and Education II: Courses Developed and Taught

### Teaching: Courses Developed

- 2016 “AI and Social Good”: A new course jointly developed with the USC School of Social Work focused on uses of AI in practical applications particularly involving low resource communities, urban societal challenges, and others.
- 2012 CSCI599/ISE599 “Security and game theory”: A new course introducing the use of game theory in security, focusing on key algorithmic principles, deployed systems and lessons learned.
- 2008 CSCI300 “Introduction to Intelligent agents using science fiction”: A new course on introducing intelligent agents to undergraduate students using science fiction as the motivator; this was based on the earlier CS499 course.
- 2006 Freshman seminar “Artificial Intelligence and science fiction”: Co-designed (with Prof. Anne Balsamo of School of Cinema/TV and my PhD student Emma Bowring) a new course on introducing artificial intelligence to freshman using science fiction as the motivator. This interdisciplinary seminar course investigates the social and cultural implications of Artificial Intelligence.
- 2006 CSCI499 “Intelligent agents and science fiction”: Co-designed (with my PhD student Emma Bowring) a new course on introducing intelligent agents to undergraduate students using science fiction as the motivator.
- 2002 CSCI543 “Software multiagent systems”: Designed this brand new course on multiagent systems from scratch, to cover key paradigms of multiagent systems research, such as Belief-desire-intention (BDI) systems, distributed constraint optimization (DCOP), distributed POMDPs and market-based systems.
- 2001 CSCI573 “Advanced Artificial Intelligence”: Redesigned and redefined course on “Advanced AI” to include recent advances in reasoning with uncertainty in AI such as latest research on single-agent and distributed POMDPs.

### Teaching and Education II: Courses Taught

- Spring 2017** CS 599, *AI and Social Good*, Computer Science Dept (joint with the School of Social Work), USC
- Spring 2016** ISE 599, *Security and Game Theory*, Industrial and Systems Engineering Dept, USC
- Fall 2009,2010,2012,2013, 2015, 2016** ENGR 102, *Freshman academy*, School of Engineering, USC
- Spring 2013** CSCI 599, *Security and Game Theory*, Computer Science Dept, USC
- Spring 2003 through to Spring 2012, Spring 2014** CSCI 543, *Software multiagent systems*, Computer Science Dept, USC
- Fall 2010** CSCI 300, *Understanding Intelligent Agents via Science Fiction*, Computer Science Dept, USC
- Spring 2007** Freshman Seminar, *Artificial Intelligence and Science Fiction*, College of Letters Arts and Sciences, USC (with co-instructor Anne Balsamo and Emma Bowring)

- Fall 2006, 2007** Freshman Micro-Seminar, *Artificial Intelligence and Science Fiction*, USC
- Fall 2006, 2008** CSCI499, *Intelligent Agents and Science Fiction*, Computer Science Dept, USC
- Spring 2002, Fall 2002 through to Fall 2005** CSCI 573 (earlier CS561B), *Advanced Artificial Intelligence*, Computer Science Dept, University of Southern California
- Fall 2001, 2000** CSCI 599, *Software Multi-agent systems*, Computer Science Dept, University of Southern California
- Fall 1996, 1995** CSCI 598, *Expert Systems*, Computer Science Dept, University of Southern California (with co-instructors Ramesh Patil and William Swartout)
- Fall 1988** Teaching assistant for 15-381, an undergraduate course on *Artificial Intelligence*, with Prof. Kurt VanLehn, at the School of Computer Science, Carnegie Mellon University.

## Teaching and Education III: International activities

### International Agents Schools

**2003-2007** Advisory committee, Americas Agents and Multiagent Systems School

**2004-2006** Chair, IFMAS Committee for agents schools in under-represented countries. Initiated and chaired a committee to enable students in “under-represented” countries to attend agents schools, taught by internationally recognized speakers.

**2003** Co-chair, Organizing committee, Second Americas School on Agents and Multiagent Systems

**2002** Chair and founding member, Organizing committee, First Americas School on Agents and Multiagent Systems

### Selected International and National Tutorials

[T23] AI for Social Good *Tutorial program for the International Conference on Autonomous Agents and Multiagent Systems, Stockholm, Sweden, July 2018*

[T22] AI for Social Good *IISc India workshop on “AI for Social Good” 2017*

[T21] M. Tambe Security games: Key Algorithmic Principles, Deployed Systems, Research Challenges *West point, US Military Academy, Reconnect conference 2016*

[T20] M. Tambe Security games: Key Algorithmic Principles, Deployed Systems, Research Challenges *Indian Police Academy, Mid-Career Training Course, India 2016*

[T19] M. Tambe Towards a science of security games *Agents Summer School at AAMAS’2016, Singapore, May 2016*

[T18] M. Tambe Towards a science of security games *International Joint Agents Workshop and Symposium (iJAWS), Japan, October 2015*

[T17] M. Tambe Towards a science of security games *Institute for Pure and Applied Mathematics (IPAM) Graduate Summer School: Games and Contracts for Cyber-Physical Security, July 2015*

[T16] M. Tambe Towards a science of security games *International Summer School on Information Security (InfoSec 2015), July 2015*

[T15] M. Tambe Game theory for Security: Key Algorithmic Principles, Deployed Systems, Research Challenges *IJCAI summer school on Artificial Intelligence, August 2013*

[T14] M. Tambe Game theory for Security: Key Algorithmic Principles, Deployed Systems, Lessons Learned *First IJCAI summer school on Artificial Intelligence, July 2012.*

[T13] M. Tambe, C. Kiekintveld Security Games *Tutorial program for the International Conference on Uncertainty in Artificial Intelligence, July, 2011.*

[T12] C. Ortiz, B. Grosz and M. Tambe. Teamwork among robots, agents and people *Tutorial program for the International Joint Conference on Artificial Intelligence, August, 2005.*

- [T11] C. Ortiz, B. Grosz and M. Tambe. Teamwork among robots, agents and people *Tutorial program for the National conference on Artificial Intelligence, July, 2004.*
- [T10] M. Tambe. Teamwork among robots, agents and people *Tutorial program for the Agents School at the International Joint Conference on Agents and Multiagent Systems, July, 2004*
- [T9] M. Tambe. Multiagent and Agent-human teamwork: Theory and Practice *The Melbourne Agents Systems School, Melbourne, Australia, July, 2003*
- [T8] C. Ortiz, B. Grosz and M. Tambe. Teamwork among robots, agents and people *Tutorial program for the Second Agents and Multiagents Systems Conference, Melbourne, Australia, July, 2003.*
- [T7] M. Tambe Multiagent and Agent-human teamwork: Theory and Practice *Tutorial program of the International Joint Conference on Artificial Intelligence, Mexico, August, 2003*
- [T6] M. Tambe Agent teamwork *European robotic research network (EURON) summer school, Lisbon, Portugal, September 2002*
- [T5] C. Ortiz, B. Grosz and M. Tambe. Agent teamwork. *Tutorial program for the First Agents and Multiagents Systems Conference, Bologna, Italy, July, 2002.*
- [T4] M. Tambe. Agent teamwork. *European Summer School on Agents, Bologna, Italy, July, 2002.*
- [T3] M. Tambe. Teamwork. *Americas School on Agents and Multiagent Systems, University of Southern California, January 2002.*
- [T2] M. Tambe. Agent teams. *International conference on High Performance Computing, Hyderabad, India, December, 2001*
- [T1] M. Tambe. Agent teamwork. *European Summer School on Agents, Prague, Czech republic, July, 2001.*

### **International Mentoring Service**

**2004** Participant and panelist at the AAAI'04 Doctoral Consortium, San Jose, CA

**2003** Participant and panelist at the IJCAI'2003 Doctoral Consortium, Acapulco, Mexico

**2003** Panelist at the "Careers Panel" Second Americas Agents and Multiagent Systems School, Acapulco

**2003** Participant and panelist at the Doctoral Consortium affiliated with the Melbourne Agents Systems School, Melbourne

## **Selected Keynote Addresses and Significant Invited Presentations**

### **Talk Title “AI and Multiagent Systems for Social Good”**

- [I230] *AAAI conference on Artificial Intelligence (AAAI), AAAI/IAAI Robert S. Engelmore Memorial Award Lecture, 2019*
- [I229] *University of Twente, The Netherlands, 2019*
- [I228] *Delft University, 2019*
- [I227] *ACM India Joint International Conference on Data Science Management of Data (CoDS-COMAD), 2019*
- [I226] *UC Santa Barbara 2018*
- [I225] *Indian Institute of Technology, Patna 2018*
- [I224] *Indian Institute of Technology, Madras 2018*
- [I223] *“Social Science Matters: The Future” series, University of Massachusetts, Amherst 2018*
- [I222] *Distinguished Lecture, University of Houston, 2018*
- [I221] *International Joint Conference on Artificial Intelligence (IJCAI), John McCarthy Award Lecture, 2018*
- [I220] *IJCAI workshop on Socio-cognitive Systems (SCS), 2018*
- [I219] *AAMAS Doctoral Consortium, AAMAS 2018*
- [I218] *International Workshop on Bi-Level Programming (IWOBIP), 2018*
- [I217] *Doctoral Consortium, International Conference on Autonomous Agents and Multiagent Systems (AAMAS), 2018*
- [I2146] *Harvard University, 2018*
- [I215] *Carnegie Mellon University (CMU) School of Computer Science, 2018*

### **Talk Title “Towards Realizing Cyber Inception: Strategic Signaling and Human Behavior Modeling in Security Games”**

- [I214] *ACM Moving Target Defense Workshop at CCS 2018*
- [I213] *Cyberdeception Workshop 2018, University of Maryland*
- [I212] *Cybersecurity Research Alliance Bootcamp Workshop 2018, Pennsylvania State University*



**Talk Title “How Can AI be Used for Social Good? Key Techniques, Applications, and Results”**

- [I211] *International Institute of Information Technology (IIIT) Hyderabad, 2018*
- [I210] *Indraprastha Institute of Information Technology (IIIT) Delhi, 2018*
- [I209] *Ministry of Electronics and Information Technology, India, 2018*
- [I208] *AAAI workshop on Smart IoT, 2018*
- [I207] *Dartmouth University, Jones Seminar 2018*
- [I206] *International Symposium on Multirobot and Multiagent Systems 2017*
- [I205] *University of Toronto, Distinguished Lecture 2017*
- [I204] *NASA AMES Machine Learning Workshop 2017*
- [I203] *Microsoft Faculty Summit 2017*
- [I202] *Microsoft Research India 2017*
- [I201] *Tata Consultancy Services, Bangalore, India 2017*
- [I200] *International Conference on Automated Planning and Scheduling (ICAPS) 2017*
- [I199] *University of Chile 2017*
- [I198] *AAAI'17 workshop on “AI/OR for social good” 2017*
- [I197] *AAAI'17 workshop on “Human Aware AI” 2017*
- [I196] *AAAI'17 workshop on “AI, Ethics and Society” 2017*
- [I195] *University of California Santa Cruz 2017*
- [I194] *Information Technology Industry Council Fall Board Meeting 2016*
- [I193] *DARPA ISAT Workshop Keynote 2017*
- [I192] *Indian Institute of Science, Bangalore, India 2016*
- [I191] *Microsoft Research, Bangalore, India, Distinguished Lecture 2016*
- [I190] *Computational Sustainability Network Virtual Seminar Series, Cornell University 2016*

**Talk Title “Towards Realizing Cyber Inception: Strategic Signaling and Human Behavior Modeling in Security Games”**

- [I189] *First International Workshop on Cyber Deception and Defenses, 2017*
- [I188] *Army Research Laboratory, 2017*

**Talk Title “Security games 10 years after ARMOR: Lessons Learned”**

- [I187] *AAAI'17 workshop on “AI and cybersecurity” 2017*

**Talk Title “One Hundred Year Study of AI: Inaugural Study, Preliminary View”**

[I186] *The White House Office of Science and Technology Policy sponsored Stanford workshop on “Future of AI”, Stanford University, 2016*

**Talk Title “Green Security: How AI can help protect endangered wildlife, fish, forests”**

[I185] *Microsoft Faculty Summit 2017*

[I184] *The White House Office of Science and Technology Policy sponsored workshop on “AI for social good”, Washington DC, 2016*

**Talk Title “Multiagent Teamwork”**

[I183] *In AAAI Spring Symposium on Intelligent Systems for Supporting Distributed Human Teamwork, Stanford 2016*

**Talk Title “PSINET: Assisting HIV Prevention Amongst Homeless Youth by Planning Ahead”**

[I182] *In AAAI Fall Symposium on Sequential Decision Making for Intelligent Agents, Washington DC 2015*

**Talk Title “Security Games: Key Algorithmic Principles, Deployed Systems, Research Challenges” (Security Games Version IV)**

[I180] *MIT Lincoln Labs 2016*

[I179] *The Netherlands Defense Academy, The Netherlands 2016*

[I178] *Delft University, The Netherlands 2016*

[I177] *IIT Delhi, India 2016*

[I176] *IIT Bombay, India 2016*

[I175] *Cornell University, 2016*

[I174] *Microsoft Research New England, 2016*

[I173] *University of Michigan, 2016*

[I172] *INFORMS Conference on Business Analytics and Operations Research, Los Angeles, 2015*

[I171] *International Joint Agents Workshop and Symposium (iJAWS), Japan, 2015*

[I170] *Simons Institute (UC Berkeley) Theoretical Computer Science workshop on “AGT and Practice”, 2015*

[I169] *Joint Invited Presentation, AAMAS workshops on “Agents and CyberSecurity (ACySe 2015)” and “Optimization in Multiagent Systems (OPTMAS)”, 2015*

[I168] *AAMAS workshop on “Issues with Deployment of Emerging Agent-Based Systems (IDEAS’2015)”, 2015*

[I167] *AAAI’15 Workshop on Computational Sustainability, 2015*

[I166] *Nagoya Institute of Technology (NIT), Japan, 2015*

[I165] *IIT, Gandhinagar, India 2015*

[I164] *National University of Singapore 2015*

[I163] *University of Texas at El Paso 2015*

[I162] *New Mexico State University 2015*

[I161] *University of Wollongong, Australia 2015*

[I160] *Griffith University, Australia 2015*

[I159] *RMIT, Australia 2015*

[I158] *University of Melbourne, Australia 2015*

[I157] *National ICT Australia (NICTA), Sydney, 2015*

**Talk Title “The Art of Research: Advice to PhD students and Junior Researchers”**

[I181] *Nagoya Institute of Technology (NIT), Japan, 2015*

**Talk Title “Green Security Games: Applications and Challenges”**

[I156] *In AAI Spring Symposium on Challenges and Opportunities in Multiagent Learning, Stanford 2016*

[I155] *Southern California Network Economics and Game Theory (NEGT) 2015*

[I154] *International Joint Conference on AI (IJCAI) workshop on Cognitive Computing 2015*

[I153] *Microsoft Research, Redmond, 2015*

[I152] *Nanyang Technological University 2015*

**Talk Title “The Emerging Science of Security Games: Key Algorithmic Principles, Deployed Systems, Research Challenges” (Security Games Version III)**

[I151] *Northeastern University, 2014*

[I150] *Rensselaer Polytechnic Institute, 2014*

[I149] *Case Western Reserve University, 2014*

[I148] *Queen’s University, Belfast, UK, 2014*

[I147] *Oxford University, UK, 2014*

[I146] *University College London, UK, 2014*

[I145] *AAAI Conference on AI (AAAI), 2014*

[I144] *The Second International Workshop on Market Design Technologies for Sustainable Development, Japan, 2014*

- [I143] *Workshop on Strategic Aspects of Terrorism, Security, and Espionage, Stony Brook Center for Game Theory, 2014*
- [I142] *AAAI'14 Workshop on Cognitive Computing for Augmented Human Intelligence, 2014*
- [I141] *University of Illinois at Urbana Champaign, Trustworthy Cyber Infrastructure for the Power Grid Center 2014*
- [I140] *University of Nebraska, Lincoln, 2014*
- [I139] *Missouri University of Science and Technology, 2014*
- [I138] *Netherlands Institute for the Study of Crime and Law Enforcement (NSCR), 2014*
- [I137] *University of Chicago, Booth School of Business, 2014*
- [I136] *University of Illinois, Chicago, 2014*
- [I135] *US Air Force Academy, 2014*
- [I134] *University of California, Berkeley, 2014*
- [I133] *Virginia State University, 2014*
- [I132] *IIT, Bombay, 2013*
- [I131] *EECS Distinguished Lecture, Vanderbilt University, 2013*
- [I130] *University of Illinois, Urbana-Champaign, 2013*
- [I129] *Singapore Management University, Singapore, 2013*
- [I128] *Nanyang Technological University, Singapore, 2013*
- [I127] *University of Texas, Austin, 2013*
- [I126] *University of Texas, Dallas, 2013*
- [I125] *AAAI Fall Symposium on "Social Networks and Social Contagion", 2013*
- [I124] *International Symposium on Foundations of Open Source Intelligence and Security Informatics, 2013*
- Talk Title "Advice to AAMAS Doctoral Consortium Students: A Research Meta-Talk"**
- [I123] *International Conference on Autonomous Agents and Multiagent Systems Doctoral Consortium, 2014*
- Talk Title "Wildlife security: Applying Computational Game Theory for Security Resource Optimization"**
- [I122] *Smithsonian National Zoological Park, 2014*

**Talk Title “A Deployed Quantal Response Based Patrol Planning System for the US Coast Guard”**

[I121] *HiPer Craft Forum, 2013*

[I120] *INFORMS Conference on Business Analytics and Operations Research (Wagner Prize Presentation), 2013*

**Talk Title “Game theory for security: Key Algorithmic Principles, Deployed Systems, Research Challenges” (Security Games Version II)**

[I119] *AAMAS workshop on “Multiagent-based Societal Systems (MASS)”, 2013*

[I118] *AAMAS workshop on “Adaptive Learning Agents (ALA)”, 2013*

[I117] *Naval Postgraduate School, 2013*

[I116] *University of California, Irvine, 2013*

[I115] *Arizona State University, 2013*

[I114] *Microsoft Research New York, 2013*

[I113] *University of Maryland, 2012*

[I112] *Virginia Tech, 2012*

[I111] *School of Computer Science, Carnegie Mellon University, 2012*

[I110] *IBM TJ Watson Research Center, 2012*

[I109] *Harvard University, 2012*

[I108] *North Carolina State University, 2012*

[I107] *Duke University, 2012*

[I106] *University of Connecticut, 2012*

[I105] *AAAI Fall Symposium on “Social Networks and Social Contagion”, 2012*

[I104] *Institute of Computing Technology, Chinese Academy of Sciences, 2012*

[I103] *University of California, Los Angeles, 2012*

[I102] *Center for Non-Linear Studies, Los Alamos National Laboratories, 2012*

[I101] *Columbia University, 2012*

[I100] *City University of New York, 2012*

[I99] *Workshop on “Safety, Security for Critical Infrastructure (SS4CI)”, Prague, 2012*

[I98] *Workshop on “Games, Networks and Markets”, Microsoft Research, Cambridge, UK 2012*

[I97] *AAMAS workshop on “Human-Agent Interaction Design and Models (HAIDM)”, 2012*

[I96] *AAAI Spring Symposium on “AI, The Fundamental Social Aggregation Challenge, and the Autonomy of Hybrid Agent Groups”, 2012*

**Talk Title “Designing Patrol Strategies to Maximize Pristine Forest Areas”**

[195] *World Bank, Washington DC, 2012*

**Talk Title “Game Theory for Security in Practice and Applications in Mumbai”**

[194] *Mumbai Police Headquarters, Mumbai, 2012*

**Talk Title “Towards Flexible Teamwork: A Retrospective”**

[193] *Lecture for the “Influential Paper Award”, International Conference on Autonomous Agents and Multiagent Systems, 2012*

**Talk Title “Collaborative Multiagent systems: DCOPS and Distributed POMDPs”**

[192] *International Workshop on Collaborative Agents – REsearch and development (CARE), 2010*

**Talk Title “Game-theory for security: Lessons learned from deployed applications” (Security Games Version I)**

[191] *International Conference on Principles and Practice of Multiagent Systems (PRIMA), 2011*

[190] *European Workshop on Multiagent Systems (EUMAS), 2011*

[189] *AAAI Fall Symposium on “Multiagent coordination under uncertainty”, 2011*

[188] *University of California, Berkeley, 2011*

[187] *International workshop on Knowledge discovery from sensor data (SensorKDD), held in conjunction with KDD’2011*

[186] *Applied Adversarial Reasoning and Risk Modeling workshop at AAAI’2011*

[185] *Soar Workshop, 2011*

[184] *International Conference on Practical Applications of Agents and Multi-Agent Systems (PAAMS), 2011*

[183] *International Conference on Algorithmic Decision Theory (ADT), 2011*

[182] *AAAI Spring Symposium on Help me Help you: Bridging the Gaps in Human-Agent Collaboration, 2011*

[181] *University of Southampton, UK, 2011*

[180] *Vrije University, Amsterdam, The Netherlands, 2011*

[179] *California Institute of Technology, 2011*

[178] *University of Massachussets, Amherst, 2011*

[177] *Harvard University, 2011*

[176] *Georgia Institute of Technology, 2011*

- [I75] *Singapore Management University*, 2011
- [I74] *Sandia National Labs*, 2011
- [I73] *California State University Dominguez Hills*, 2011
- [I72] *Computer Science Dept, University of the Pacific*, 2011
- [I71] *University of Michigan, Ann Arbor, STIET Seminar*, 2010
- [I70] *IEEE/WIC/ACM International Conference on Intelligent Agent Technology (IAT)*, 2010
- [I69] *Computer Science Dept, University of Massachusetts at Amherst*, 2010
- [I68] *Artificial Intelligence Research Institute (IIIA), Barcelona, Spain*, 2010
- [I67] *APTIMA, Boston, MA*, 2010
- [I66] *GerminAIT, Mumbai, India*, 2010
- [I65] *SRI International, Menlo Park, CA*, 2010
- [I64] *CCICADA Center of excellence in research for homeland security, Rutgers University*, 2010
- [I63] *Workshop on Analysis and Modeling for Security (WAMOS) Santiago, Chile*, 2010
- [I62] *Southern California Network Economics and Game Theory Workshop*, 2009

**Talk Title “Multiagent systems: Lessons learned from putting theory into practice”**

- [I61] *Carnegie Mellon University Silicon Valley, Seminar Series*, 2010
- [I60] *Monterey Bay Aquarium Research Institute (MBARI) Seminar Series*, 2010
- [I59] *IBM TJ Watson Research Center, New York*, 2010
- [I58] *International Workshop on Optimization in Multiagent Systems (OPTMAS), held in conjunction with AAMAS’09*
- [I57] *International Workshop on Agent Design: Adapting from Practice to Theory (ADAPT), held in conjunction with AAMAS’09*
- [I56] *National Reconnaissance office, Washington DC*, 2009
- [I55] *RI seminar, School of Computer Science, Carnegie Mellon University*, 2009
- [I54] *First Jay Modi Memorial lecture, Computer Science Department, Drexel University*, 2008
- [I53] *Computer Science Department, UC Riverside*, 2008

**Talk Title “The Application of a Game Theoretic Model for Security at the Los Angeles International Airport”**

- [I52] *RAND Corp, Santa Monica*, 2008

**Talk Title “Agent Teams: Safety and Security”**

[151] *International workshop on safety and security in multiagent systems, at AAMAS’2006*

**Talk Title “A Report on the International Conference on Autonomous Agents and Multiagent Systems 2004”**

[150] *National Conference on Artificial Intelligence (AAAI), 2005*

**Talk Title “Virtual Reality Simulations for Disaster Rescue”**

[149] *US-Israel Science and Technology Foundation symposium on applications of virtual reality, Israel, 2005*

**Talk Title “Multiagent Teamwork: Hybrid Approaches to the Rescue”**

[148] *Bar-Ilan Symposium on Foundations of AI, BISFAI’2007*

[147] *Computer Science Department, University of California, Irvine, 2007*

[146] *Multiagent Planning and Scheduling Workshop (in conjunction with ICAPS’2005), 2005*

[145] *Fourth International Joint Conference on Agents and Multiagent Systems (AAMAS), 2005*

[144] *NASA Ames Research Center, 2005*

**Talk Title “Multiagent teamwork: From Belief-desire-intentions to POMDPs and Back”**

[143] *AI Seminar, School of Computer Science, Carnegie Mellon University, Pittsburgh, 2005*

**Talk Title “Teamwork: A Distributed POMDP Perspective”**

[142] *Second Brazilian Symposium on Artificial Intelligence, Brazil, 2004*

[141] *AAMAS International workshop on programming multiagent systems (ProMAS), 2004*

**Talk Title “Electric Elves: Towards an Agent-Facilitated Human Organization”**

[140] *AAAI Spring Symposium on What When Wrong and Why, 2006*

[139] *AAAI Spring Symposium, Workshop on Safe Learning Agents, Stanford, CA, 2002.*

[138] *Aethersystems Distinguished Lecture Series on Mobile and Wireless Computing, University of Maryland (UMBC), Maryland, 2000.*

**Talk Title “Implications of RoboCup for general multiagent research”**

[137] *American Open RoboCup Workshop, Carnegie Mellon University, Pittsburgh, 2003*

**Talk Title “Towards Team-Oriented Programming”**

[136] *PRIMA, Pacific Rim International Workshop on Multi-agent Systems, Taipei, Taiwan, 2001*

[135] *IJCAI workshop on Adjustable Autonomy, International joint conference on Artificial Intelligence (IJCAI), 1999.*



**Talk Title “Towards conflict resolution in agent teams via argumentation.”**

[134] *AAAI workshop on conflicts in Agents*, National conference on Artificial Intelligence (AAAI), 1999.

**Talk Title “Agent Teams: Theory and Practice”**

[133] *CS colloquium, Harvard University*, Boston, 2003

[132] *Distinguished Speaker series, Computer Science Department, Columbia University*, New York, 2003

[131] *AAAI workshop on Multiagent Planning*, Edmonton, Canada, 2002

[130] *NASA Jet Propulsion Laboratory (JPL)*, Pasadena, CA, 2002

[129] *SRI International*, Menlo Park, CA, 2002

[128] *Navy Center for Applied Research in Artificial Intelligence (NCARAI)*, Naval Research Labs, Washington, DC, 2002

[127] *AT & T Shannon research labs*, NJ, 2001

[126] *Computer Science Department, Rutgers University*, 2001.

[125] *Computer Science Department, University of Illinois at Urbana-Champaign*, 2001.

[124] *College of Computing, Georgia Tech*, 2000.

[123] *Computer Science Department, University of Massachusettes, Amherst, Mass*, 2000.

[122] *Computer Science Department, University of Maryland*, Maryland, 2000.

[121] *NASA Ames Research Center*, San Jose, CA, 2000.

[120] *Air Force Research Laboratory*, Rome, NY, 2000.

**Talk Title “Towards Flexible Teamwork”**

[119] *CS Colloquim, Harvard University* 1998.

[118] *International cooperation workshop on Intelligent Robotic Systems*, Porto Alegre, Brazil, 1997. Sponsored by the National Science Foundation and Brazilian Conselho Nacional de Desenvolvimento Científico Tecnológico (CNPq).

[117] *DARPA Young Researchers Workshop*, in conjunction with the National Conference on Artificial Intelligence (AAAI-97), 1997.

[116] *Queen Mary and Westfield College*, London, United Kingdom, 1998.

[115] *Computer Science Department, University of Maryland* 1998.

[114] *SRI International*, 1998.

[113] *Computer Science Department, Stanford University* 1997.

[112] *Linkoping University*, Linkoping, Sweden, 1997.

[111] *SAAB Research*, Linkoping, Sweden, 1997.

**Talk Title “Intelligent Agents for Interactive Simulation Environments”**

[110] *Center for Study of Language and Information, Stanford University, 1995*

**Talk Title “Parallelism Matters”**

[19] *Symposium in honor of Allen Newell, School of Computer Science, Carnegie Mellon University, 1992.*

**Talk Title “Eliminating Combinatorics from Production Match”**

[18] *Georgia Institute Technology, 1994*

[17] *Computer Science, University of Florida, Gainesville, 1994*

[16] *National Center for Software Technology, India, 1989*

**Talk Title “Parallelism in Production Systems”**

[15] *National Center for Software Technology, India, 1989*

[14] *Indian Institute of Technology, Madras, India, 1989*

[13] *USC/Information Sciences Institute, 1988*

[12] *Tata Institute of Fundamental Research, Bombay, India, 1988*

[11] *Indian Institute of Technology, Bombay, India, 1988*

**Invited Participation in Selected Significant Panels**

- [P19] M. Tambe (with M. Whittaker, J. Clark) AI and Society *Washington Post 2018 TRANSFORMERS panel on Artificial Intelligence*
- [P18] M. Tambe (with J. Makower, M. Patron, Z. Ferdana, K. Gobush) *GLOBE FORUM 2018 "Hacking the Future: How AI Can Boost Resiliency and Improve Conservation"*
- [P17] M. Tambe (with S. Russell, F. Rossi, M. Witbrock) AI for Social Good *AI for Good Foundation Panel in conjunction with IJCAI 2017*
- [P16] M. Tambe (Panel Moderator) AI for Social Good *AAAI conference on AI (AAAI), 2017*
- [P15] M. Tambe (with Z. Romanow, R. Kirkpatrick) AI for Social Good *Bloomberg Government symposium on "Data Revolution: How AI and Machine Learning are Remaking Our World", San Francisco, 2016*
- [P14] M. Tambe (with K. Crawford, B. Schrelis, M. Whittaker) White House OSTP workshops on AI *International Joint Conference on AI (IJCAI), 2016*
- [P13] M. Tambe (with B. Grosz, Y. Shoham) One Hundred Year Study of AI *The White House OSTP sponsored workshop at Stanford on "Future of Artificial Intelligence", 2016*
- [P12] M. Tambe (with K. Tumer, A. Nowe, K. Hindriks) AAMAS and industrial applications *International Conference on Autonomous Agents and Multiagent Systems (AAMAS) 2016*
- [P11] M. Tambe (Panel Chair) Theory and practice at AAMAS: Provoking a balance *International Conference on Autonomous Agents and Multiagent Systems (AAMAS) 2015*
- [P10] M. Tambe (with A. Odlyzko, S. Das) How can we drive GameSec theoretical findings towards significant practical impacts? *Decision and Game Theory for Security (Gamesec) 2013*
- [P9] M. Tambe (with M. Miller, D. Basin) Emerging science of security *Computer Security Foundations Symposium 2013*
- [P8] M. Tambe (with E. Southers, D. Boyd, J. Curren, T. Trafford, J. Sullivan) Game Theory and Security *National Homeland Security Conference 2013*
- [P7] M. Tambe (with S. Sen, A. Ghose, A. Sattar, J. Hsu, M. Yokoo, L. Sonnenberg) Agents for Sustainability *International Conference on Principles and Practices of Multiagent Systems (PRIMA 2011)*
- [P6] M. Tambe (with E. Heikkila, E. Southers, M. Ressa) Combating Terrorism: Science, Technology and the Human Element *USC Global Conference, Hongkong 2011*
- [P5] M. Tambe (with E. Horvitz, B. Selman et al) AAI presidential panel on long-term AI futures *International Joint Conference on Artificial Intelligence (IJCAI), 2009*
- [P4] M. Tambe (with K. Fischer, A. Omicini, A. Segrouchni et al) Agent Oriented Methodologies and Programming Languages: Towards Practical Systems *International Conference on Agents and Multiagent Systems (AAMAS), 2009*

- [P3] M. Tambe (with L. Johnson, C. Pelachud, et al) Agent-human interactions in agents and multiagent systems International Joint Conference on Agents and Multiagent Systems (AAMAS), 2002
- [P2] M. Tambe (with M. Wooldridge, M. Georgeff, B. Pell, M. Pollack) The belief-desire-intention model of agency International Workshop on Agents, Theories, Architectures and Languages (ATAL), 1998
- [P1] M. Tambe (with S. Stolfo, M. Perlin, et al) Is production system match interesting? International Conference on Tools for AI, 1992.

**Service I: National, State, City Service**

**2018** Testimony on “AI for Social Good” at the Little Hoover Commission, Sacramento, California. The commission is an independent oversight agency for the state of California

**2016** LAX Airport Security Peer Review Panel

**2010-2012** Appointed to National Academies Soldier Systems Panel

**2010-2012** Appointed to National Academies Air and Ground Vehicle Technology Panel

**2010** Appointed to Blue Ribbon Panel to review security at LAX by Los Angeles Mayor Villaraigosa

**2009** DARPA Information science and technology study-group (ISAT) on “Solving games of National Importance”

**2001** DARPA Information science and technology study-group (ISAT) on “Robot-agent-person” (RAP) teams

## **Service II: Research Community**

### **Trustee, Standing Committee, Board of Directors, Steering Committee**

- 2018-** Standing Committee of AI100 (100 year study on Artificial Intelligence)
- 2018-** Steering Committee of ACM COMPASS Conference
- 2015-** Steering Committee of the Conference on Decision and Game Theory for Security (GameSec).
- 2007-** Scientific advisory board, Germinait Solutions pvt. limited
- 2001-2007** Steering committee member for the International workshop on Agents, Theories, Architectures and Languages (ATAL). ATAL dissolved 2007.
- 2000-2008** Member of the board of directors of the International Foundation for Multi-agent Systems (IFMAS). IFMAS is sponsors major international events on multi-agent systems, such as the International Conference on Multi-agent Systems.
- 2001-2004** Planning committee member for the Pacific Rim International Multi-agent Systems Workshop (PRIMA).
- 1999-2001** Trustee of RoboCup (robot world cup soccer) federation responsible for sponsoring RoboCup soccer events worldwide.

### **Presidential Panels, Study Panels**

- 2015-16** First AI100 Study Panel sponsored by AAAI, Stanford University “100 year study of Artificial Intelligence”
- 2009** AAAI Presidential panel on “Long-term AI futures”

### **Editorial Boards**

- 2017-** Editorial Board, Computational Socio-Cognitive Systems
- 2016-** Track co-editor, Special track on AI and Society, Journal of AI Research
- 2013-** Editorial board, SpringBriefs Intelligent Systems series
- 2005-2010** Advisory board, Journal of Artificial Intelligence Research
- 2002-2007** Advisory board, Springer series on cognitive science and artificial intelligence
- 2002-2005** Associate editor, Journal of Artificial Intelligence Research
- 2000-2005** Editorial Board Member, IEEE Intelligent Systems
- 1999-2008** Associate editor, Journal of Autonomous Agents and Multi-agent Systems.
- 1997-2002** Editorial Board Member, Journal of Artificial Intelligence Research.
- 1994-1996** Associate Editor, Book Reviews, *AI Magazine*.

**Guest Editor**

**2002** Special issue, Artificial Intelligence Journal *Best of ICMAS'2000* (With S. Kraus and H. Nakayama)

**2002** Special issue, Constraints Journal *Constraints and Agents* (With P. Eaton and T. Freuwirth)

**Award Committee**

**2019** IJCAI Research Award Committee

**2013-15** Chair, ACM SIGART Autonomous Agents Research Award Committee

**Conference Chairperson**

**2019** Chair of special track on “AI for Societal Impact”, AAAI conference

**2016** General Co-Chair of conference on Computational Sustainability

**2016** Chair of special track on “Validating Models”, Conference on Decision and Game Theory for Security (GameSec)

**2014-15** Co-Founder and Co-Chair, Conference on Conservation, Computation and Criminology (C4)

**2015** Application track co-chair, International Conference on Autonomous Agents and Multiagent Systems

**2004** General co-chair, International conference on Autonomous Agents and Multiagent systems.

**2000** Program Co-chair, Fourth International Conference on Multi-Agent Systems.

**1998** Finance Chair, Second International Conference on Autonomous Agents.

**1997** Local Arrangements Chair, First International Conference on Autonomous Agents.

**Workshop Chairperson**

**2017** “AI for Social Good” workshop at the University of Southern California

**2016** CCC and White House Office of Science and Technology Policy Workshop on AI for Social Good

**2014** Chair, Workshop on Wildlife security: An inter-disciplinary perspective

**2012** Co-chair, Workshop on Populations & Crowds: Dynamics, Disruptions and their Computational Models

**2011** General co-chair, International Workshop on Collaborative Agents – REsearch and Development (CARE)

**2001** Program Co-chair, International Workshop on Agents Theories, Architectures and Languages

**1998** Co-chair, Collective Robotics Workshop, held in conjunction with AgentsWorld'98, Paris, France.

**1996** Co-chair, Workshop on Agent Modeling, 1996, held in conjunction with the National Conference on Artificial Intelligence, AAI-96.

**1993** Co-chair, Second workshop on innovative applications of productions systems, held in conjunction with the International Joint Conference on Artificial Intelligence, IJCAI-93.

### **Area Chair/Area Expert**

**2016** International Conference on Autonomous Agents and Multiagent Systems

**2017, 2016, 2013** International Joint Conference on Artificial Intelligence

**2018, 2012, 2011, 2010** National Conference on Artificial Intelligence

### **Conference Advisory Committee**

**2017** International Conference on Autonomous Agents and Multiagent Systems Industrial Engagement Advisor

**2015** International Joint Conference on Artificial Intelligence

### **Senior program committees**

**2008, 2007, 1999, 1998** National Conference on Artificial Intelligence

**2009, 2007** International Joint Conference on Artificial Intelligence

**2013, 2012, 2010, 2009, 2005, 2003, 2002** International Conference on Autonomous Agents and Multi-agent Systems

**2001** International conference on Autonomous Agents

### **Program committees**

**2011** Practical Applications of Agents and Multiagent Systems (PAAMS)

**2011** International Conference on Decision and Game Theory for Security

**2011** International Conference on Algorithmic Decision Theory

**2008, 2006** International Joint Conference on Autonomous Agents and Multi-agent Systems

**2006** National Conference on Artificial Intelligence

**2007, 2006** Distributed Constraint Reasoning (DCR) workshop

**2006** International Symposium on AI and Mathematics

**2003, 2001, 1997** International Joint Conference on Artificial Intelligence

**2004** FLAIRS'2005 Special track on distributed constraint reasoning

**2004** SBIA'2004 Second Brazilian Symposium on Artificial Intelligence

**2003** CEEMAS'2003 Central and Eastern European conference on multiagent systems

**2002** AAMAS'2002 workshop on team and coalition formation

**2002** NASA workshop on planning and scheduling

**2000, 1999, 1998, 1997, 1996** Workshop on Agents, theories, Architectures and Languages.



- 1999, 1997** International conference on Autonomous Agents.
- 1999** AAAI'99 workshop on conflicts in agents.
- 1999** AAAI Spring Symposium on Agents with Adjustable Autonomy.
- 1998** International conference on Multi-Agent Systems.
- 1998** International conference on Artificial Intelligence Planning systems.
- 1998** AAAI spring symposium on Satisficing models.
- 1998** International Workshop on RoboCup: Robot world-cup soccer.
- 1997** Workshop on Constraints and Agents.
- 1996, 1992** National conference on Artificial Intelligence.
- 1995** International conference on Tools for Artificial Intelligence.

### **Organizing committees**

- 2017** "AI for Social Good" workshop at Microsoft Research India
- 2017** Doctoral Consortium on Computational Sustainability
- 2015** IJCAI workshop on Behavioral, Economic and Computational Intelligence for Security
- 2012** AAAI fall symposium on Social Networks and Social Contagion
- 2010** International Workshop on Agent Technologies for Energy Systems held in conjunction with AAMAS'2012 (ATES 2012)
- 2010** AAAI spring symposium on game theory for security, health and sustainability
- 2010** DIMACS workshop on Adversarial Decision Making
- 2006** AAMAS workshop on Agent technology for disaster management
- 2005** AAAI spring symposium on AI technologies for homeland security
- 2004, 2003, 2002** Americas School on agents and Multiagent Systems.
- 1998** AAAI spring symposium on multi-modal reasoning.
- 1996-99** Executive committee, robot world cup soccer, *RoboCup*.
- 1995** Second International Workshop on Agents, theories, architectures, and languages (ATAL).
- 1991** Workshop on innovative applications of productions systems, held in conjunction with IJCAI-91.

### **NSF Review Panels**

- 2011, 2003, 1999, 1996** National Science Foundation (NSF) review panel, Arlington, VA.

## Other Service to the Research Area: Public Domain systems

All of the following systems are available for download from <http://teamcore.usc.edu/software.htm>

- **DCOP algorithms:** <http://teamcore.usc.edu/dcop> provides several DCOP algorithms. For example, ADOPT is a new polynomial space algorithm for distributed constraint optimization, DCOP. ADOPT is guaranteed to find an optimal solution, or a solution within a user-specified distance from the optimal, while allowing agents to execute asynchronously and in parallel. We provide Java based implementations of ADOPT and preprocessing algorithms, as well as data-sets for experimentation. In addition, new “k-optimal” algorithms are also made available.
- **JESP family of algorithms for Distributed POMDPs:** JESP (Joint equilibrium-based search for policies) is an algorithm that finds locally optimal policies for distributed POMDPs (Nair et al, IJ-CAI’03). Code for the original JESP, as well as its enhancements for networked distributed POMDPs (LID-JESP) (Nair et al, AAAI’05), are in the public domain, along with sample data sets.
- **Machinetta teamwork proxies:** Machinetta is a Java version of teamwork proxies (that contain reusable teamwork models) for rapid development of RAP (Robots, Agents, People) teams. Researchers do not have to encode team coordination algorithms repeatedly; instead, use of proxies reduces this burden.

## Service III: University, School and Departmental Service

### University Service

**2018-2019** USC-wide AI+X effort. Under leadership of dean Yortsos, we have launched a USC wide effort to have a joint AI effort across the university starting in Fall 2018. I am the main coordinator for this effort. This has required a large number of meetings and conversations.

**2013** University Research Committee member

**2012** Zumberge Interdisciplinary Fund evaluation panel

**2011-2012** Social sciences transformative hiring committee

**2010-2014** Leading the “Game theory and Human behavior”(GTHB) group, a university-wide group of over 60 faculty members, funded by the USC research collaboration grant. <http://gthb.usc.edu> provides an overview of our effort. GTHB has been organizing a series of workshops, seminars, and student events to build a new interdisciplinary partnership among our members, leading toward a new PhD program and other joint events. Major initiatives include:

- hiring senior star faculty in GTHB
- starting a new PhD certificate program in GTHB

**2008** Ad-hoc General Education Review Committee

**2008** Discovery scholars prize committee

### Viterbi School of Engineering Service

**2017** Security and Sustainability committee under Dean Yortsos

**2016** Research Awards Selection committee

**2015-** Informatics program faculty member

**2015,2013,2012** Transformative hiring committee member

**2015-16** CREATE Research Internal Advisory Committee

**2012** Core faculty member, Informatics program

**2011-** Advisory committee for VSoE Global Academic Initiatives and for VSoE India Initiatives

**2011** Engineering Parents events, promotion committee for research track faculty members, hiring and tenure committees

**2011** Engineering Parents events, promotion committee for research track faculty members, hiring and tenure committees

**2010** Engineering scholarship interviews, Parents events, promotion committee for research track faculty members, hiring and tenure committees (2)

**2009** Engineering scholarship interviews, Parents events, promotion committees for tenure track and research faculty members, Discover USC Engineering EXPO

**2008** Engineering scholarship interviews, Parents events, promotion committees for tenure track and research faculty members

### **Price School of Public Policy**

**2015-** Advisor committee, Safe Communities Institute (SCI)

### **Computer Science Department Service**

**2018-19** Promotion committee ISI candidate

**2018-19** Department Leadership committee

**2017-18** Joint appointment committee

**2017-18** Hiring committee

**2017-18** Promotion committee ISI candidate

**2016-17** Hiring committee

**2014** Teaching award nomination committee

**2012, 2013** Chair, Transformative Hiring Committee

**2012** Faculty AFR evaluation committee

**2011-12** Faculty search committee

**2008** Research faculty committee, Ad-hoc committee for research faculty

**2007** Chair, research faculty promotion committee, research faculty appointment committee

**2005** Co-chair, Faculty search committee, research faculty promotion committee

**2004** Departmental evaluation committee, faculty search committee

**2001-** Organized the agents@usc effort (an umbrella effort for various agents related activities at USC), including the agents@usc web site, agents@usc mailing lists, agents@usc lecture series

**2003-2005** Group leader of the *Autonomy* group

**2002-2003** Chair of research faculty hiring committee, Phd Requirements committee, Chair of three-year review committee, chair of tenure-appointment committee

**2001-2002** Promotions committee for research faculty, AI Course restructuring committee, hiring committee

### **Industrial and Systems Engineering Department Service**

**2015-16, 2014-15** Faculty search committee

## **Consulting**

**2013** Consultant to Perceptronics Inc on DART Phase II

**2013** Consultant to Aptima Inc on DARPA PLAN X

**2003** Study panel for NASA on the use of agent technology in NASA applications, conducted by the Institute for Human-Machine Cognition, University of West Florida,

**2001** Study panel for DARPA on the potential for research in agent and multiagent technology with potential for DARPA applications, conducted by the Institute for Human-Machine Cognition, University of West Florida, DARPA Information technology assessment consortium (ITAC)

## Selected Articles in Popular Media Discussing Our Research

All articles and details available at: <http://teamcore.usc.edu/news-content.htm>

- *Maharashtra signs MoU with US University*, **Indian Express**, October 2018
- *How AI can outsmart criminals and improve society*, **PC Magazine**, April 2018
- *New AI system may help check TB spread in India*, **Venturebeat.com**, March 2018
- *Poachers dont stand a chance against these A.I.-powered camera drones*, **Digital Trends**, February 2018
- *Le deep learning pour traquer les braconniers de nuit*, **Sciences et Avenir**, February 2018
- *AI systems may help check TB spread in India*, **The Tribune**, India, February 2018
- *USC Center for AI in Society*, **KPFK Radio**, “**Digital Village**”, January 2018
- *How AI Could Slow the Spread of HIV*, **Citylab.com**, October 2017
- *AI is targeting some of the world’s biggest problems: homelessness, terrorism, and extinction*, **Venturebeat.com**, October 2017
- *How AI is Changing the Workplace*, **Fox News**, October 2017
- *How Machine Learning and Game Theory are Trumping Poachers*, **Financial Express, India**, May 2017
- *How to Embrace AI for Enacting Humanitarian Change*, **Entrepreneur**, April 2017
- *Robots, AI take the stage at Brown*, **Providence Journal**, April 2017
- *CNN Newsroom: Artificial Intelligence, Jobs, Social good*, **CNN International**, January 2017
- *Hunt the Hunter: A combination of machine learning and game theory is being used to fight elephant poaching in Uganda*, **Quartz.com**, September 2016
- *Rangers Try Gaming Technology to Protect African Wildlife*, **Reuters**, September 2016
- *Modern Airports Offer No Easy Way Out for Panicking Crowds*, **IEEE Spectrum**, September 2016
- *Could artificial intelligence help humanity? Two California universities think so*, **Los Angeles Times**, August 2016 (Also in **Government Technology News** September 2016).
- *Putting Artificial Intelligence On The Hunt For Poachers*, **Fast Co-exist**, June 2016
- *Rangers Use Artificial Intelligence to Fight Poachers*, **National Geographic**, June 2016
- *More than boots and bullets: This app could help turn the tide on poaching* , **Los Angeles Times**, June 2016
- *Advanced Game Theory Goes to Work for Homeland Security*, **Government Computer News**, June 2016

- *Outwitting poachers with artificial intelligence*, **National Science Foundation** Press release appeared in the following and many others:
  - *Artificial Intelligence Fights Wildlife Poaching: The National Science Foundation unleashes A.I. against criminals*, **Popular Science**, April 2016
  - *Artificial intelligence used to combat poaching*, **Times of India**, April 2016
  - *Artificial intelligence used to combat poaching*, **Economic Times**, April 2016
  - *Artificial intelligence being used to stop wildlife poaching in Africa*, **International Business Times**, April 2016
  - *To catch wildlife poachers, computer scientists turn to AI*, **Christian Science Monitor**, April 2016
  - *Forest rangers now turning to advanced AI and mathematical models to help curb poaching*, **Daily News and Analysis**, April 2016
  - *Artificial Intelligence to Help Curb Poaching: Study*, **NDTV Gadgets**, April 2016
  - *How Game Theory and Artificial Intelligence Help Wildlife Conservation by Outwitting Poachers*, **Nature World News**, April 2016
  - *Scientists Outwit Poachers With The Help Of Artificial Intelligence*, **Science World Report**, April 2016
- *Grounding AI: Artificial Intelligence is Closer – and Less Awesome – than Most Realize*, **Government Technology**, January 2016
- *26 incredible innovations that improved the world in 2015*, **Mashable**, December 2015
- *Modelling How Information Spreads By Word Of Mouth Is Helping Stop HIV*, **FastCompany**, March 2015
- *Avata Intelligence: Applying Computer Game Theory To Real Life Problems*, **SoCalTech**, March 2015
- *Security Company to Set Up USC as Safety School*, **Los Angeles Business Journal**, March 2015
- *Artificial Intelligence Could Help Reduce HIV Among Homeless Youths*, **Motherboard News**, February 2015
- *Can an Algorithm Help Prevent HIV From Spreading Among Homeless Young People?*, **NextCity**, February 2015
- *How an Algorithm Can Help Spread HIV Information Among Homeless Teens*, **Mashable**, February 2015
- *Software can now beat any human player at poker*, **New Scientist**, January 2015
- *The computer that taught itself to bluff*, **Popular Science**, January 2015
- *Mumbai taught us to expect the unexpected: LAPD*, **The Times of India**, January 2014
- *Counter-insurgency software goes stateside*, **Government Technology Magazine**, July 2013

- *How the US Coast Guard uses game theory to protect New York city*, **Business Insider**, May 2013
- *Game theory that defeats terrorists*, **Defensenews.com**, May 2013
- *USC-Created Company Advises On Randomization Of Security Measures*, **Homeland Security Today**, May 2013
- *Ports of Long Beach, Los Angeles using USC software to beef up security*, **Contra Costa Times, Long Beach Press Telegram**, February 2013
- *USC Engineered Anti-Terrorism System Deployed at Ports of Los Angeles and Long Beach*, **Maritime Executive News**, February 2013
- *Game theory: introducing randomness to airport security*, **airport-technology.com**, July 2012
- *Play games, make policy*, **Economic times of India**, Sept 2011
- *Port of Boston Not playing Games with its Security*, **Security Products Article**, 2011
- *Villaraigosa appoints panel to review security at LAX*, **Los Angeles Times (web version)**, Nov 2010
- *Villaraigosa appoints panel to study LAX security*, **Daily Breeze**, Nov 2010
- *Technology developer honored*, **Homeland security today**, Nov 2010
- *Poker research spurs good deal for airport security*, **Richmond Times-Dispatch**, Sept 2010
- *Research on poker a good deal for airport security*, **Pittsburgh Post-Gazette**, August 2010
- *Random Acts - Software Program Keeps Would-be Terrorists Guessing*, **R-Tech news letter**, Jun 2009
- *Police behaving predictably: The other enemy*, **Officer.com**, Feb 2009
- *ARMOR security at LAX*, **Fox News Channel 11 Local news**, Jan 2009
- *LAX Checkpoint nets Weapons hoard*, **Dailybreeze.com**, Jan 2009
- *The ARMOR system appears on the Web Site*, **Polish web site Gazeta**, Nov 2008
- *Software randomizes airport patrols*, **Security Management Magazine**, Sept 2008 issue
- *LAX goes reliably random*, **Government Computer News**, Feb 4, 2008
- *From Routine to Random*, **Homeland Security Today**, Feb 1, 2008
- *New anti-terror weapon: Game Theory*, **Daily News and Analysis, DNA**, Mumbai, Oct 7, 2007.
- *Anti Terror Squad Sriharikota-born researcher and his Mumbai-born professor help improve airport security in the US*. **Yuva**, Mumbai, Oct 8, 2007.
- *USC student's computer program enlisted in the war against terror*, **Los Angeles Times**, Oct 1, 2007
- *The element of surprise*, **Newsweek**, Web edition, September 28, 2007 and International Edition Oct 22, 2007.



- *LAX uses randomization software to prevent terrorist attack*, AP News, Sept 29, 2007
- *ARMOR security at LAX*, **Channel 4 Local news**, Sept 2007
- *Disaster game to the rescue*, **The Daily Breeze**, March 2006
- *Disaster game to the rescue*, **Channel 11 and Channel 13 news in Los Angeles**, March 2006
- *Ever learning elves*, **Government technology magazine**, March 2001
- *Software robots roam the net for better or for worse*, **AP News Story**, appeared in several news outlets throughout the world, including:
  - **CNN.com** February 10, 2001,
  - **Philadelphia Enquirer** Feb 15, 2001
  - **Central Maine Newspaper** Feb 18, 2001
  - **Evansville courier press, Fort Worth Star Telegram**,...
- *Just have your elves call my elves: Software aides learn to anticipate every desire* **USA TODAY**, October 30, 2000.
- *Just argue it out: Computer conflicts needn't lead to disaster* **New Scientist**, January 15, 2000.
- *Soccer robots train for their world cup*, **The Sunday Times, London**, May 12, 1996.