

# Kartik Talamadupula

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## Contact Information

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Citations: [Google Scholar - Kartik Talamadupula](#)  
LinkedIn: [LinkedIn - Kartik Talamadupula](#)

## Education

- Ph.D. Computer Science, Arizona State University. GPA: 3.9/4.0
- B.S. Computer Science (*Summa cum Laude*), Arizona State University. GPA: 4.0/4.0

## Professional Experience

**Research Staff Member** 2018–Present  
**AI Science: Reasoning**  
Manager: Michael Witbrock **IBM Research AI**  
Working on optimization and reasoning techniques for challenging machine reading and complex question-answering tasks, particularly in the context of standardized testing.

**Research Staff Member** 2017–2018  
**Human-Agent Collaboration**  
Manager: Rachel K. E. Bellamy **IBM T.J. Watson Research Center**  
Worked on adding AI planning and sequential decision-making support to human-agent collaborative systems. Specific focus was on natural language conversation, collective decision-making, and model acquisition via learning techniques.

**Research Staff Member** 2014–2016  
**End-to-End Conversation Systems**  
Manager: Murray S. Campbell **IBM T.J. Watson Research Center**  
Worked on applying automated planning, recurrent neural networks, and reinforcement learning techniques to problems in the space of automated dialog modeling, tracking, and generation. Previously applied POMDP solution, planning, and learning techniques to predictive modeling problems.

**Graduate Research Assistant** 2008–2014  
Advisor: Subbarao Kambhampati **Arizona State University**  
Worked on using automated planners as mediators for human-machine teams. Ph.D. thesis centered around the problem of *Human-Robot Teaming* and providing planning support for such teams, and the various issues related to dynamic models, goals, and worlds.

## Patents: Filed

System and method for integrating multiple-domain learning and personalization in dialog systems for a single user; A. Kishimoto, O. Alkan, A. Botea, E. Daly, M. Davis, V. Liao, R. Marinescu, B. Srivastava, K. Talamadupula, and Y. Zhang.

System and method for integrating multiple-domain problem solving in dialog systems for a single use; A. Botea, O. Alkan, E. Daly, M. Davis, A. Kishimoto, V. Liao, R. Marinescu, B. Srivastava, K. Talamadupula, and Y. Zhang.

A System and Method for Conducting Multi-Agent Automated Dialogs; B. Srivastava, and K. Talamadupula; Patent No. 93558673.

System and Method for Learning Actionable Domain Models of Plans from Online Data; S. Sohrabi, L. Manikonda, A. Riabov, K. Talamadupula, B. Srivastava, and D. Turaga; Patent No. 93559340.

System and Method for Learning Personalized Actionable Domain Models of Plans from Online Traces and a Person's Social Network; S. Sohrabi, K. Talamadupula, L. Manikonda, and B. Srivastava; Patent No. 93560680.

### **Mentoring Experience**

- Mentored T. Chakraborti to 2016 & 2017 IBM Ph.D. Fellowships and summer internships.
- Graduate Mentor to S. Sethia, recipient of the [FURI Fellowship](#), Spring 2014.
- Army Research Office (ARO) [URAP](#) Graduate Mentor, 2014.
- Mentored S. Ravikumar (Amazon, Inc.) & M. Vijayakumar (Esri) to Masters (M.S.) thesis.

### **Relevant Coursework**

- **Graduate:** Stochastic Dynamic Programming; Advanced Geometric Modeling; Software Verification, Validation & Testing; Applied Cryptography; Artificial Intelligence; Combinatorial Algorithms; Game Theory; Multi-Agent Systems; Machine Learning; Social Computing & Web Analytics; Randomized & Approximation Algorithms; Planning & Learning Methods in AI; Theory of Computation.
- **Undergraduate:** Computer Systems Security; Software Engineering & Project Management; Operating Systems; Multimedia Information Systems; Intro to Artificial Intelligence; Design & Analysis of Algorithms; Principles of Programming Languages; Probability & Statistics; Data Structures; Computer Organization & Architecture; Intro to Theory of Computation; Intro to Software Engineering; Assembly & Microprocessor Programming; Digital Design Fundamentals.

### **Workshops Organized**

[Scheduling & Planning Applications Workshop \(SPARK\) 2018](#); S. Bernardini, S. Parkinson, K. Talamadupula; In the Twenty Eighth International Conference on Automated Planning and Scheduling (ICAPS), 2018.

[Human-Aware Artificial Intelligence \(HAAI-17\)](#); K. Talamadupula et al.; In the Thirty First AAAI Conference on Artificial Intelligence (AAAI), 2017.

[Scheduling & Planning Applications Workshop \(SPARK\) 2017](#); S. Bernardini, S. Parkinson, S. Sohrabi, K. Talamadupula; In the Twenty Seventh International Conference on Automated Planning and Scheduling (ICAPS), 2017.

[Closing the Cognitive Loop: Third Workshop on Knowledge, Data, and Systems for Cognitive Computing](#); K. Talamadupula, S. Sohrabi, M. Campbell; In the Twenty Fifth International Joint Conference on Artificial Intelligence (IJCAI), 2016.

### **Refereed Tutorials**

[Human-in-the-Loop Planning and Decision Support](#); S. Kambhampati, K. Talamadupula; In the Twenty Ninth AAAI Conference on Artificial Intelligence (AAAI), 2015.

### **Publications: Journal Articles**

An Embodied Cognitive Assistant for Visualizing and Analyzing Exoplanet Data; J.O. Kephart, V.C. Dibia, J. Ellis, B. Srivastava, K. Talamadupula, and M. Dholakia; *IEEE Internet Computing Journal* (Special Issue on Cognitive Services and Intelligent Chatbots) (2018).

Architectural Mechanisms for Handling Human Instructions for Open-World Mixed-Initiative Team Tasks and Goals; K. Talamadupula, G. Briggs, M. Scheutz, and S. Kambhampati; *Advances in Cognitive Systems (ACS) Journal*; Vol. 5 (2017); pp. 37-56.

*Herding the Crowd: Using Automated Planning for Better Crowdsourced Planning*; L. Manikonda, T. Chakraborti, K. Talamadupula, and S. Kambhampati; Human Computation Journal (HCJ); Vol. 4, No. 1 (2017).

Planning for Human-Robot Teaming in Open Worlds; K. Talamadupula, J. Benton, S. Kambhampati, P. Schermerhorn, M. Scheutz; In the ACM Transactions on Intelligent Systems and Technology (TIST); November 2010.

#### **Publications: Refereed Conferences**

Towards Cognitive-and-Immersive Systems: Experiments in a Shared (or common) Blockworld Framework; M. Peveler, B. Srivastava, K. Talamadupula, N. S. Govindarajulu, S. Bringsjord, and H. Su; In Advances in Cognitive Systems (ACS) 2018.

The Limits of Abstract Evaluation Metrics: The Case of Hate Speech Detection; A. Olteanu, K. Talamadupula, and K.R. Varshney; In the proceedings of WebScience (WebSci) 2017.

Learning to Query, Reason, and Answer Questions on Ambiguous Texts; X. Guo, T. Klinger, C. Rosenbaum, J.P. Bigus, M. Campbell, B. Kawas, K. Talamadupula, G. Tesauero, and S. Singh; In the proceedings of the International Conference on Learning Representations (ICLR) 2017.

*UbuntuWorld 1.0 LTS - A Platform for Automated Problem Solving and Troubleshooting in the Ubuntu OS*; T. Chakraborti, K. Talamadupula, K.P. Fadnis, M. Campbell, and S. Kambhampati; In the proceedings of IAAI/AAAI, 2017.

Multiresolution Recurrent Neural Networks: An Application to Dialogue Response Generation; I.V. Serban, T. Klinger, G. Tesauero, K. Talamadupula, B. Zhou, Y. Bengio, and A. Courville; In the proceedings of AAAI, 2017; and the NIPS CoCo Workshop, 2016. *Finalist, 2017 IBM Pat Goldberg Memorial Best Paper Competition*

A Knowledge Driven Policy Framework for Internet of Things; E. Goyngur, G.R. De Mel, M. Sensoy, K. Talamadupula, and S. Calo; International Conference on Agents and Artificial Intelligence (ICAART) 2017.

Planning for Serendipity; T. Chakraborti, G. Briggs, K. Talamadupula, M. Scheutz, D. E. Smith, S. Kambhampati; In the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015.

TweetSense: Context Recovery for Orphan Tweets by Exploiting Social Signals in Twitter; M. Vijayakumar; T. M. Umamaheshwar; K. Talamadupula, S. Kambhampati; In the ACM Web Science Conference, 2015 (Poster).

Predicting User Engagement on Twitter with Real-World Events; Y. Hu, S. Farnham, K. Talamadupula; In the 9th AAAI International Conference on Weblogs and Social Media (ICWSM), 2015.

Coordination in Human-Robot Teams Using Mental Modeling and Plan Recognition; K. Talamadupula, G. Briggs, T. Chakraborti, M. Scheutz, S. Kambhampati; In the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2014.

*AI-MIX: How a Planner Can Help Guide Humans Towards a Better Crowdsourced Plan*; L. Manikonda, T. Chakraborti, S. De, K. Talamadupula, S. Kambhampati; In the Twenty-Sixth Annual Conference on Innovative Applications of Artificial Intelligence (IAAI), 2014.

Easychair as a Pedagogical Tool; K. Talamadupula, S. Kambhampati; In the Fifth AAAI Symposium

on Educational Advances in AI (EAAI), 2014.

Architectural Mechanisms for Handling Human Instructions in Open-World Mixed-Initiative Team Tasks; K. Talamadupula, G. Briggs, M. Scheutz, S. Kambhampati; In the Second Annual Conference on Advances in Cognitive Systems (ACS), December 2013.

*Herding the Crowd*: Automated Planning for Crowdsourced Planning; K. Talamadupula, S. Kambhampati, Y. Hu, T. Nguyen, H. H. Zhuo; In the First International Conference on Human Computation (HCOMP) WiP Track, 2013.

*RAProp*: Ranking Tweets by Exploiting the Tweet/User/Web Ecosystem and Inter-Tweet Agreement; S. Ravikumar, K. Talamadupula, R. Balakrishnan, S. Kambhampati; In the ACM International Conference on Information and Knowledge Management (CIKM), 2013.

*RAProp*: Ranking Tweets by Exploiting the Tweet/User/Web Ecosystem and Inter-Tweet Agreement; S. Ravikumar, K. Talamadupula, R. Balakrishnan, S. Kambhampati; In the Proceedings of the 27th AAAI Conference (AAAI) LBP Track, 2013.

*Dude, srsly?*: The Surprisingly Formal Nature of Twitter's Language; Y. Hu, K. Talamadupula, S. Kambhampati; In the Proceedings of the 7th International AAAI Conference on Weblogs and Social Media (ICWSM), 2013.

*Tell Me When and Why to Do It!*: Run-time Planner Model Updates via Natural Language Instruction; R. Cantrell, K. Talamadupula, P. Schermerhorn, J. Benton, S. Kambhampati, M. Scheutz; In the Proceedings of the 7th ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2012.

Integrating a Closed World Planner with an Open World Robot; K. Talamadupula, J. Benton, P. Schermerhorn, S. Kambhampati, M. Scheutz; In the Proceedings of the 24th AAAI Conference on Artificial Intelligence (AAAI), 2010.

G-value Plateaus: A Challenge for Planning; J. Benton, K. Talamadupula, P. Eyerich, R. Mattmüller, S. Kambhampati; In the Proceedings of the 20th International Conference on Automated Planning and Scheduling (ICAPS), 2010.

Finding and Exploiting Goal Opportunities in Real-time during Plan Execution; P. Schermerhorn, J. Benton, M. Scheutz, K. Talamadupula, S. Kambhampati; In the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2009.

Evaluating Temporal Planning Domains; W. Cushing, D. S. Weld, Mausam, S. Kambhampati, K. Talamadupula; In the Proceedings of the 17th International Conference on Automated Planning and Scheduling (ICAPS), 2007.

### **Publications: Workshops & Technical Reports**

A Systematic Classification of Knowledge, Reasoning, and Context within the ARC Dataset; M. Boratko, H. Padigela, D. Mikkilineni, P. Yuvraj, R. Das, A. McCallum, M. Chang, A. Fokoue, P. Kapanipathi, N. Mattei, R. Musa, K. Talamadupula, and M. Witbrock; In the ACL 2018 Machine Reading for Question Answering (MRQA) Workshop. *Best Paper Award*

Visualizations for an Explainable Planning Agent; T. Chakraborti, K.P. Fadnis, K. Talamadupula, M. Dholakia, B. Srivastava, J.O. Kephart, and R.K.E. Bellamy; In the ICAPS 2018 Explainable AI Planning (XAIP) Workshop; and the ICAPS 2018 User Interfaces and Planning and Scheduling (UISP) Workshop.

NL2PDDL: A Conversational Interface for Model Generation and Iteration; K.P. Fadnis and K. Talamadupula; In the ICAPS 2018 User Interfaces and Planning and Scheduling (UIPS) Workshop.

User Interfaces and Scheduling and Planning: Workshop Summary and Proposed Challenges; R.G. Freedman, T. Chakraborti, K. Talamadupula, D. Magazzeni, and J.D. Frank; AAAI Spring Symposium Series 2018.

Tentacular Artificial Intelligence, and the Architecture Thereof, Introduced; S. Bringsjord, N.S. Govindarajulu, A. Sen, M. Peveler, B. Srivastava, and K. Talamadupula; In the IJCAI 2018 AEGAP Workshop.

Workflow Complexity for Collaborative Interactions: *Where are the Metrics?*; K. Talamadupula, B. Srivastava, and J.O. Kephart; In the ICAPS 2017 Workshop on User Interfaces and Scheduling and Planning (UIPS).

Extracting Incomplete Planning Action Models from Unstructured Social Media Data to Support Decision Making; Manikonda, L., Sohrabi, S., Talamadupula, K., Srivastava, B., and Kambhampati, S.; In the ICAPS 2017 Workshop on Knowledge Engineering for Planning and Scheduling (KEPS).

Automatic Resolution of Policy Conflicts in IoT Environments Through Planning; E. Goynugur, K. Talamadupula, G.R. de Mel, and M. Sensoy; In the proceedings of the ICAPS Scheduling and Planning Applications Workshop (SPARK), 2016.

A Formal Framework for Studying Interaction in Human-Robot Societies; T. Chakraborti, K. Talamadupula, Y. Zhang, S. Kambhampati; In the Symbiotic Cognitive Systems Workshop at AAAI, 2016.

Planning for Serendipity - Altruism in Human-Robot Cohabitation; T. Chakraborti, G. Briggs, K. Talamadupula, M. Scheutz, D. E. Smith, S. Kambhampati; In the PlanRob Workshop at ICAPS, 2015.

*The Metrics Matter!*: On the Incompatibility of Different Flavors of Replanning; K. Talamadupula, D. E. Smith, S. Kambhampati; arXiv Technical Report 1405.2883, 2014.

*AI-MIX*: How a Planner Can Help Guide Humans Towards a Better Crowdsourced Plan; L. Manikonda, T. Chakraborti, S. De, K. Talamadupula, S. Kambhampati; In the ICAPS 2014 Scheduling and Planning Applications Workshop (SPARK).

*Herding the Crowd*: Automated Planning for Crowdsourced Planning; K. Talamadupula, S. Kambhampati; arXiv Technical Report 1307.7720, 2013.

Strategic Planning for Network Data Analysis; K. Talamadupula, O. Udrea, A. Riabov, A. Ranganathan; arXiv Technical Report 1305.2561, 2013.

On the Many Interacting Flavors of Planning for Robotics; K. Talamadupula, M. Scheutz, G. Briggs, S. Kambhampati; In the ICAPS 2013 Planning and Robotics (PlanRob) Workshop.

A Theory of Intra-Agent Replanning; K. Talamadupula, D. E. Smith, W. Cushing, S. Kambhampati; In the ICAPS 2013 Workshop on Distributed and Multi-Agent Planning (DMAP).

Planning for Human-Robot Teaming; K. Talamadupula, S. Kambhampati, P. Schermerhorn, J. Benton, M. Scheutz; In the ICAPS 2011 Scheduling and Planning Applications Workshop (SPARK).

Integrating a Closed World Planner with an Open World Robot: A Case Study; K. Talamadupula, J. Benton, P. Schermerhorn, S. Kambhampati, M. Scheutz; In the ICAPS 2009 Workshop on Bridging

the Gap between Task and Motion Planning (BTAMP).

Evaluating Temporal Planning Domains; William Cushing, Daniel S. Weld, Mausam, Subbarao Kambhampati, Kartik Talamadupula; In the ICAPS 2007 Workshop on the International Planning Competition: Past, Present and Future.

### Systems Demonstrations & Exhibits

An Interface for Annotating Science Questions; M. Boratko, H. Padigela, D. Mikkilineni, P. Yuvraj, R. Das, A. McCallum, M. Chang, A. Fokoue, P. Kapanipathi, N. Mattei, R. Musa, K. Talamadupula, and M. Witbrock; EMNLP System Demonstration Program (2018).

Visualizations for an Explainable Planning Agent; T. Chakraborti, K.P. Fadnis, K. Talamadupula, M. Dholakia, B. Srivastava, J.O. Kephart, and R.K.E. Bellamy; In the ICAPS 2018 Systems Demonstrations Program. *ICAPS 2018 Best Demo Award Runner Up*

NL2PDDL: A Conversational Interface for Model Generation and Iteration; K.P. Fadnis and K. Talamadupula; In the ICAPS 2018 Systems Demonstrations Program.

A Cognitive Assistant for Visualizing and Analyzing Exoplanet Data; J. O. Kephart, V.C. Dibia, J. Ellis, B. Srivastava, K. Talamadupula, and M. Dholakia; In the AAAI 2018 Systems Demonstrations Program. *AAAI 2018 Best Technical Demonstration Award*

*AI-MIX*: How a Planner Can Help Guide Humans Towards a Better Crowdsourced Plan; L. Manikonda, T. Chakraborti, S. De, K. Talamadupula, S. Kambhampati; ICAPS 2014 Systems Demonstrations and Exhibits. *ICAPS 2014 Best Demo Award*

*Teach Me How To Work*: Natural Language Model Updates and Action Sequencing; S. Sethia, K. Talamadupula, S. Kambhampati; ICAPS 2014 Systems Demonstrations and Exhibits.

Planning for Agents with Changing Goals; K. Talamadupula, P. Schermerhorn, J. Benton, S. Kambhampati, M. Scheutz; ICAPS 2011 Demonstrations and Exhibits Program. *Placed 3rd for Best Demo*

### Research Service

- **Organizer**: SPARK Workshop (ICAPS 2018, ICAPS 2017); UISP Workshop (ICAPS 2017); Human-Aware AI (HAAI) Workshop (AAAI 2017); Cognitive Computing Workshop (IJCAI 2016).
- **Artificial Intelligence Professional Interest Community (PIC)**, IBM Research: Chair, Jul 2015–Nov 2016.
- **Senior Program Committee**: AAAI 2019; AAAI 2018; IJCAI 2017; IJCAI 2016.
- **Program Committee**: ICAPS 2018; ACS 2018; ICWSM 2018; WWW 2018; CHI 2018; ICAPS 2017; AAAI 2017; ICWSM 2017; WWW 2017; AAAI 2016; ICWSM 2015; AAAI 2015; AAAI 2014; ICWSM 2014; ACM Multimedia 2013; CP4PS Workshop, AAAI 2012; TAMPRA Workshop, ICAPS 2012.
- **Auxiliary Reviewer**: WSDM 2014; AAAI 2011; ICAPS 2009.

### Honors and Awards

- Best Paper Award, MRQA Workshop at ACL 2018.
- Runner Up, Best Technical Demonstration Award, ICAPS 2018.
- Best Technical Demonstration Award, AAAI 2018.
- University Graduate Fellowship Award (Summer 2013).
- Science Foundation Arizona (SFAz) Fellow, 2008-2010.

- Honorable Mention, Computing Research Association (CRA) Outstanding Undergraduate Student Awards 2008.
- Department of Computer Science Distinguished Undergraduate Senior Award, 2008.
- [Fulton Undergraduate Research Initiative \(FURI\)](#) Fellow, 2008.