Yuqing Tang
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Education

- Ph.D. in Computer Science, the Graduate Center, City University of New York, February 2012
- M.Phil. in Computer Science, the Graduate Center, City University of New York, September 2008
- B.Eng. in Computer Science, Shenzhen University, China, June 1999

Appointments held

- February 2012 – Present
  Postdoctoral Fellow, Robotics Institute, School of Computer Science, Carnegie Mellon University
- September 2002 – January 2012
  Research Assistant, Doctoral Program in Computer Science, the Graduate School and University Center of the City University of New York.
- September 2010 – December 2010
  Adjunct Lecturer, Department of Computer and Information Science at Brooklyn College of the City University of New York.
- June 2009 – August 2009
  Research Intern, IBM Research Lab.
- July 2006 – August 2006
  Adjunct Lecturer, Department of Computer and Information Science at Brooklyn College of the City University of New York.
- June 2005 – August 2005
  Graduate Assistant, New York State Banking Department.
- March 2001 – August 2002
  Software Engineer, Billion Online INT'LTD (China).
- January 2000 – January 2001
  Senior Software Engineer, Vinside Information Technology INC (China).
- June 1999 – December 2000
  Research Programmer, Shenzhen University (China).

Research Interests

I am interested in the establishment of social intelligence for a system of agents (e.g. machine agents, human, or hybrid human-machine agents). In particular, my current research interests can be aligned as follows:

- Structured inference framework (e.g. structured SVMs, conditional random fields, and max-margin Markov logic networks) for argumentation-based output (e.g. competing conclusions along with their argumentation structures),
- Incorporating subjective knowledge and objective data into probabilistic argumentation-based reasoning,
- Interaction and communication mechanisms for intelligent agents,
- Multiagent planning approaches, e.g. symbolic logics, model checking, stochastic processes, and machine learning.

Teaching Interests

- Multiagent systems
  - Logical, probabilistic, game theoretical, and economic paradigms to the artificial intelligence of a society of machines and human users
- Artificial intelligence
- Machine learning
- Programming
- Data structures
- Algorithms
- Introductory courses to computer science

Research projects

- **Presenting Relevant Facts and Answers from Inconsistent and Uncertain Information (February 2012 – Present)** Pittsburgh, PA
  - Created framework to link raw data (images, radar, voice, video and so on), human reports along with their probabilistic characterization to decision makings
  - Integrated semantic-web reasoning, Dempster-Shafer probabilistic reasoning, and argumentation-based reasoning
  - Created presentation model of relevant facts and answers to reduce human users' cognitive load
  - Implemented a prototype of the system in JAVA
- **Argumentation-based Reasoning about Trusts on Inconsistent and Uncertain Information (August 2010 – February 2012)** New York, NY
  With Professor Simon Parsons
  - Created a model of argumentation-based reasoning about trust
  - Created a model of probabilistic evidences (in terms of Dempster-Shafer theory) propagation in argumentation for trusts
  - Implemented a prototype of the system in JAVA
- **Models of Hybrid Human Agent Teams: Agent support for ad hoc adaptive collaboration (August 2007– 2011)** New York, NY
  With Professor Simon Parsons
  - Created formal models of multiagent (machine) dialogues for aiding human collaborative planning and plan execution
  - Developed non-deterministic state transition and Markov decision process models for machine team dialogues
  - Developed argumentation-based reasoning for resolving inconsistent information
  - Applied symbolic model checking techniques (implicit set and relation manipulations using Binary Decision Diagrams) to reduce the computation complexity
  - Implemented the dialogue model in C++
  - Analyzed data collected from human dialogues during team plan executions

- **Agent-based Modeling Simulation of Education, Human Capital and Economics (August 2004–August 2007)** New York, NY
  With Professor Simon Parsons and Professor Elizabeth Sklar
  - Translated equation-based models of education, human capital and economics into agent-based models
  - Demonstrated the possibility of simulating the interaction effects of non-equational social dynamics (drawn from data) and non-equational social policies
  - Simulated both the micro behaviors at level of individual agent and the macro behaviors at the level of the agent society
  - Implemented and analyzed the models in Java with RePast (a Java based agent simulation platform)
  - Replicated the results of the equation based models
  - Discovered new model behaviors beyond the equation based models
- **Matrix Eigen Problems and Polynomial Root-finding (August 2003–August 2005)** New York, NY
  With Professor Victor Pan
  - Implemented matrix eigen solving algorithms using C++ and Matlab
  - Implemented polynomial root-finding algorithms using C++ and Matlab

Teaching Experience

- **Brooklyn College, CUNY** September 2010 – December 2010
  Adjunct Lecturer New York, NY
  - Lectured graduate course CIS 7414x (graduate level) – Expert Systems
    With a focus on Bayesian networks in expert systems.
    `http://web.cs.gc.cuny.edu/~tang/teachings/cis7414x`
  - Given lectures, designed and graded homework, midterm and final examinations
  - Covered rule-based inferences, Bayesian Networks, Dempster-Shafer theory, and etc.
- **Brooklyn College, CUNY** July 2006 – August 2006
  Adjunct Lecturer New York, NY
  - Lectured undergraduate course CIS 1.0 – Computing: Its Nature, Power, and Limits
    `http://web.cs.gc.cuny.edu/~tang/teachings/cis10`
  - Given lectures, designed and graded homework, midterm and final examinations

Industry Experience

- **IBM Research Lab** June 2009–August 2009
  Research Intern Hawthorne, NY
  - Developed ontology based data conversion for sensors in ISR (Intelligence, Surveillance, and Reconnaissance) systems
- **New York State Banking Department** June 2005–August 2005
  Graduate Assistant New York, NY
  - Designed and developed a computer program to collect and process banking data into a data warehouse
- **Billion Online INT'LTD** March 2001–August 2002
  Software Engineer Shenzhen, China

- Integrated email systems (include webmail, mailing list, etc.) with qmail, ezmlm and sqwebmail, etc; rewrote part of them with C++
- Co-led the first phrase development of the EIM (Enterprise Instant Messenger) and ETALK (Voice over Internet) project with OpenH323, C++ and pwlib

- **Vinside Information Technology INC.** January 2000–January 2001
  Senior Software Engineer Shenzhen, China
  - Initiated a technical team to develop a distributed instant messaging system
  - Participated in fund raising to start up the company
  - Designed a software architecture which later had more than 50 programmers work on it
  - Implemented the core of a multi-server instant messaging system targeting a huge number of users with C++, OpenLDAP, MYSQL on hybrid FreeBSD and Linux systems which later had about 0.5 million registered users
  - Led a team to integrate instant messaging technology into office automation systems

Honors

- Graduate Center Technology Fellowship CUNY-GC, 2006 – 2007
- University Fellowship CUNY-GC, 2002 – 2007
- Excellent Degree Project Award Shenzhen University, 1999
- First-class Scholarship, Excellent Student Shenzhen University, 1995 – 1998

Computer Skills

- Tools and Libraries: Matlab, LAPACK, Repast, TOMCAT, PostgreSQL, MYSQL, Open LDAP, JSP, Oracle, MS SQL Server, Lex/Yacc
- Operating Systems: LINUX, FREEBSD, Windows

Professional Activities

- Journal reviewer:
  - International Journal of Approximate Reasoning, 2013
  - ACM Transactions on Intelligent Systems and Technology, 2013
  - Artificial Intelligence (AIJ), 2009
  - Journal of Computation and Logic, 2009
  - IEEE Intelligent Systems, 2007
- Program committee member:
  - Program committee member of International Conference on Autonomous Agents and Multi-Agent Systems, 2014
  - Second International Workshop on Theory and Applications of Formal Argumentation, IJCAI 2013 workshops
  - Program committee member of the Tenth International Workshop on Argumentation in Multi-Agent Systems (ArgMAS), 2013
  - Program committee member of International Conference on Autonomous Agents and Multi-Agent Systems, 2013
  - Program committee member of the Ninth International Conference on Autonomic and Autonomous Systems (ICAS), 2013

  - Program committee member of the Ninth International Workshop on Argumentation in Multi-Agent Systems (ArgMAS), 2012

- Conference and workshop reviewer:
  - International Workshop on Uncertainty Reasoning for the Semantic Web (URSW), 2012
  - International Conference on Autonomous Agents and Multi-Agent Systems, 2013
  - International Conference on Autonomous Agents and Multi-Agent Systems, 2012
  - International Conference on Autonomous Agents and Multi-Agent Systems, 2011
  - International Symposium on Logical Formalizations of Commonsense Reasoning, 2011

- University and Departmental service:
  - Computer Science Curriculum Committee, 2006 - 2012
  - Graduate Council, 2008 - 2012

Publications

Journal Articles

- Yuqing Tang, Federico Cerutti, Nir Oren, and Chatschik Bisdikian. Reasoning about the impacts of information sharing. *Information Systems Frontiers*, 2014. (to appear)

- Yuqing Tang, Kai Cai, Peter McBurney, Elizabeth Sklar, and Simon Parsons. Using argumentation to reason about trust and belief. *Journal of Logic and Computation*, 2011

- Victor Y. Pan, Dmitriy Ivolgin, Brian Murphy, Rhys Eric Rosholt, Islam Taj-Eddin, Yuqing Tang, and Xiaodong Yan. Additive preconditioning and aggregation in matrix computations. *Computers and Mathematics with Applications*, 55(8):1870–1886, 2008

- Victor Y. Pan, Brian Murphy, Rhys Eric Rosholt, Yuqing Tang, Xinmao Wang, and Ailong Zheng. Eigen-solving via reduction to DPR1 matrices. *Computers and Mathematics with Applications*, 56(1):166–171, 2008

- Victor Y. Pan, Mikhail Kunin, Brian Murphy, Rhys Eric Rosholt, Yuqing Tang, Xiaodong Yan, and Wenbo Cao. Linking the TPR1, DPR1 and Arrow-head Matrix Structures. *Computers and Mathematics with Applications*, 52(10-11):1603–1608, November-December 2006

Refereed Major Conference Papers

- Paul Smart, Katia Sycara, and Yuqing Tang. Using cognitive architectures to study issues in team cognition in a complex task environment. In *SPIE Defense, Security, and Sensing: Next Generation Analyst II*, May 2014

- Chatschik Bisdikian, Yuqing Tang, Federico Cerutti, and Nir Oren. A framework for using trust to assess risk in information sharing. In *Proceedings of the 2nd International Conference on Agreement Technologies*, 2013

- Lance M. Kaplan, Murat Sensoy, Yuqing Tang, Supriyo Chakraborty, Chatschik Bisdikian, and Geeth de Mel. Reasoning under uncertainty: Variations of subjective logic deduction. In *Proceedings of the 16th International Conference on Information Fusion (FUSION)*, 2013

- Murat Sensoy, Achille Fokoue, Jeff Z. Pan, Timothy J. Norman, Yuqing Tang, Nir Oren, and Katia Sycara. Reasoning about uncertain information and conflict resolution through trust revision. In *Proceedings of the 2013 International Conference on Autonomous Agents and Multi-agent Systems*, AAMAS '13, pages 837–844, Richland, SC, 2013. International Foundation for Autonomous Agents and Multiagent Systems. (22% acceptance rate)

- Yuqing Tang, Chung-Wei Hang, Simon Parsons, and Munindar P. Singh. Towards argumentation with symbolic dempster-shafer evidence. In *Computational Models of Argument - Proceedings of COMMA 2012*, pages 462–469, 2012

- Yuqing Tang, Felipe Meneguzzi, Simon Parsons, and Katia Sycara. Probabilistic hierarchical planning over mdps. In *Proceedings of the Tenth International Joint Conference on Autonomous Agents and Multiagent Systems*, 2011. (extended abstract), (22% acceptance rate, additional 23% for extended abstracts)

- Simon Parsons, Yuqing Tang, Elizabeth Sklar, Kai Cai, and Peter McBurney. Argumentation-based reasoning in agents with varying degrees of trust. In *Proceedings of the Tenth International Joint Conference on Autonomous Agents and Multiagent Systems*, 2011. (22% acceptance rate)

- Yuqing Tang, Timothy J. Norman, and Simon Parsons. A model for integrating dialogue and the execution of joint plans. In *Proceedings of the Eigth International Joint Conference on Autonomous Agents and Multiagent Systems*, Budapest, Hungary, May 10-15 2009. (22% acceptance rate)

- Yuqing Tang and Simon Parsons. A dialogue mechanism for public argumentation using conversation policies. In *Proceedings of the Seventh International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 445–452, Estoril, Portugal, May 12-16 2008. (22% acceptance rate)

- Yuqing Tang, Simon Parsons, and Elizabeth Sklar. An agent-based model that relates investment in education to economic prosperity. In *Proceedings of the 6th International Conference on Autonomous Agents and Multi-Agent Systems*, Honolulu, 2007. (poster), (22% acceptance rate, additional 25% for posters)

- Yuqing Tang, Simon Parsons, and Elizabeth Sklar. Agent-based modeling of human education data. In *Proceedings of the 5th International Conference on Autonomous Agents and Multi-Agent Systems*, Hakodate, Japan, 2006. (short paper), (23% acceptance rate, additional 25% for short papers)

- Yuqing Tang and Simon Parsons. Argumentation-based dialogues for deliberation. In *Proceedings of the Fourth International Joint Conference on Autonomous Agents and Multiagent Systems*, pages 552–559, New York, NY, USA, 2005. ACM Press. (25% acceptance rate)

Other Refereed Conference Papers

- Yuqing Tang, Felipe Meneguzzi, Katia Sycara, Murat Sensoy, Jeff Z. Pan, Achille Fokoue, and Mudhakar Srivatsa. Towards presenting relevant facts and answers on inconsistent and uncertain knowledge. In *Proceedings of 2012 ACITA Conference*, Southampton, UK, 2012

- Yuqing Tang, David C. Emele, Timothy J. Norman, and Simon Parsons. Learning to communicate more efficiently in human-agent teams. In *Proceedings of the Third Annual Conference of the ITA*, Imperial College, London, 2010

- Felipe Meneguzzi, Yuqing Tang, Katia Sycara, and Simon Parsons. On representing planning domains under uncertainty. In *Proceedings of the Third Annual Conference of the ITA*, Imperial College, London, 2010

- Yuqing Tang, Timothy J. Norman, and Simon Parsons. Towards the implementation of a system for planning team activities. In *Proceedings of the Second Annual Conference of the ITA*, University of Maryland University College, Maryland, 2009

- Yuqing Tang, Timothy J. Norman, and Simon Parsons. Agent-based dialogues to support plan execution by human teams. In *Proceedings of the Second Annual Conference of the ITA*, Imperial College, London, 2008

- Simon Parsons, Steven Poltrock, Helen Bowyer, and Yuqing Tang. Analysis of a recorded team coordination dialogue. In *Proceedings of the Second Annual Conference of the ITA*, Imperial College, London, 2008

Refereed Workshop and Symposium Papers

- Yuqing Tang, Alice Toniolo, Katia Sycara, and Nir Oren. Argumentation random field. In *Eleventh International Workshop on Argumentation in Multi-Agent Systems*, 2014
- Paul R Smart, Darren P. Richardson, Katia Sycara, and Yuqing Tang. Towards a cognitively realistic computational model of team problem solving using act-r agents and the elicit experimentation framework. In *19th International Command and Control Research Technology Symposium (ICCRTS'14)*, June 2014
- Yuqing Tang, Nir Oren, Simon Parsons, and Katia Sycara. Dempster-shafer argument schemes. In *Tenth International Workshop on Argumentation in Multi-Agent Systems*, 2013
- Yuqing Tang, Elizabeth Sklar, and Simon Parsons. An argumentation engine: Argtrust. In *Ninth International Workshop on Argumentation in Multiagent Systems*, 2012
- Yuqing Tang, Felipe Meneguzzi, Katia Sycara, and Simon Parsons. Planning over MDPs through probabilistic HTNs. In *AAAI 2011 Workshop on Generalized Planning*, San Francisco, August 2011
- Felipe Meneguzzi, Yuqing Tang, Katia Sycara, and Simon Parsons. An approach to generate MDPs using HTN representations. In *IJCAI Workshop on Decision Making in Partially Observable Uncertain Worlds: Exploring Insights from Multiple Communities*, Barcelona, Spain, July 2011
- Simon Parsons, Yuqing Tang, Kai Cai, Elizabeth Sklar, and Peter McBurney. Some thoughts on using argumentation to handle trust. In *Proceedings of the 12th International Workshop on Computational Logic in Multi-Agent Systems*, Barcelona, 2011
- Yuqing Tang. Integrating multiagent dialogues, planning and plan execution. In *20th International Conference on Automated Planning and Scheduling Doctoral Consortium*, Toronto, Canada, 2010
- Yuqing Tang, Kai Cai, Elizabeth Sklar, Peter McBurney, and Simon Parsons. A system of argumentation for reasoning about trust. In *Proceedings of the 8th European Workshop on Multi-Agent Systems*, Paris, France, December 2010
- Yuqing Tang, Timothy J. Norman, and Simon Parsons. Computing argumentation in polynomial number of bdd operations: A preliminary report. In *Seventh International Workshop on Argumentation in Multiagent Systems*, 2010
- Victor Y. Pan, Dmitriy Ivolgin, Brian Murphy, Rhys Eric Rosholt, Islam Taj-Eddin, Yuqing Tang, and Xiaodong Yan. Additive preconditioning in matrix computations. In *Proceedings of the Third International Computer Science Symposium*, 2008
- Yuqing Tang, Simon Parsons, and Elizabth Sklar. An agent-based model that relates investment in education to economic prosperity. In *Proceedings of the Workshop on Multiagent-based Simulation*, Honolulu, 2007
- Victor Y. Pan, Dmitriy Ivolgin, Brian Murphy, Rhys Eric Rosholt, Yuqing Tang, Xinmao Wang, and Xiaodong Yan. Real root-finding. In Stephen M. Watt and Jan Verschelde, editors, *Proceedings of the International Workshop on Symbolic-Numeric Computation*, pages 161–169. ACM, July 2007
- Yuqing Tang, Simon Parsons, and Elizabeth Sklar. Modeling human education data: From equation-based modeling to agent-based modeling. In *Proceedings of the Workshop on Multiagent-based Simulation*, Hakodate, Japan, 2006
- Yuqing Tang and Simon Parsons. Using argumentation-based dialogues for distributed plan management. In *Proceedings of the AAAI Spring Symposium on Distributed Plan and Schedule Management*, Stanford, 2006. (position paper)
- Yuqing Tang and Simon Parsons. Argumentation-based multi-agent dialogues for deliberation. In Simon Parsons, Nicolas Maudet, Pavlos Moraitis, and Iyad Rahwan, editors, *Second International Workshop on Argumentation in Multiagent Systems*, pages 229–244, 2005. (invited paper)

Book Chapter

- Victor Y. Pan, Brian Murphy, Rhys Eric Rosholt, Guoliang Qian, and Yuqing Tang. Root-finding with Eigen-solving. In Dongming Wang and Lihong Zhi, editors, *Symbolic-Numeric Computation*, pages 185–210. 2007