SHIWALI MOHAN

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RESEARCH INTERESTS

Human-agent interaction & collaboration, cognitive architectures and agents

EDUCATION

2009-2015 Doctor of Philosophy, Computer Science & Engineering
University of Michigan, Ann Arbor

2008-2009 Master of Science & Engineering, Computer Science & Engineering
University of Michigan, Ann Arbor

2003-2007 Bachelor of Engineering, Instrumentation & Control Engineering
Netaji Subhas Institute of Technology, Delhi University, New Delhi

EMPLOYMENT

2015-present Member of Research Staff, Palo Alto Research Center

2014-2015 Postdoctoral Researcher, Palo Alto Research Center

2007-2008 Software Engineer, Yahoo! Research & Development, India

AWARDS & HONORS

2018 Blue Sky Award, at the 32^{nd} AAAI Conference on Artificial Intelligence

2008 Best Paper Award, at 9^{th} International Conference on Computational linguistics and Intelligent Text Processing

FUNDING

2018-2019 Air Force Office of Scientific Research (AFOSR)
Levels of Learning in Natural and Artificial Agents

2017-2018 Advanced Research Projects Agency-Energy (ARPA-E)
Collaborative Optimization and Planning for Transportation Energy Reduction

PUBLICATIONS

Dissertation

[D1] **Shiwali Mohan**. From Verbs to Tasks: An Integrated Account of Task Learning from Situated Interactive Instruction. *University of Michigan, Ann Arbor*, 2015.

Book Chapters

[B1] John Laird, **Shiwali Mohan**, James Kirk, Aaron Mininger. The Learning Problem in Interactive Task Learning. *Ernst Strunngman Forum - Interactive Task Learning Agents, Robots, and Humans and Acquiring New Tasks through Natural Interaction (invited, forthcoming)*. 2019.

[B2] Dario Salvucci, John Laird, Fredrick Chang, Kenneth Forbus, Parisa Kordjamshidi, Tom Mitchell, **Shiwali Mohan**, Michael Spranger, S Stevenson, Andrea Stocco, Gregory Trafton. Learning in Interactive Task Learning. *Ernst Strunngman Forum - Interactive Task Learning Agents, Robots, and Humans and Acquiring New Tasks through Natural Interaction (forthcoming)*. 2019.

Journal Articles

[J1] **Shiwali Mohan**, Hesham Rakha, Matthew Klenk. Acceptable Planning: Influencing Individual Behavior to Reduce Transportation Energy Expenditure of a City. *In preparation*. 2019.

[J2] **Shiwali Mohan**. Towards Comprehensive mHealth Systems: Exploring the Role of Cognitive Architectures in Designing Theory-based Coaching Interactions. *In preparation*. 2019.

[J3] **Shiwali Mohan**, Anusha Venkatakrishnan, Andrea Hartzler. Observations from Deploying an Intelligent Interactive Health Coach to Promote Aerobic Exercise. *Under review*. 2019.

[J4] Aaron Springer, Anusha Venkatakrishnan, **Shiwali Mohan**, Les Nelson, Michael Silva, Peter Pirolli. Leveraging Self-Affirmation to Increase mHealth Behavior Change. *Journal of Medical Information Research*. 2018.

[J5] Peter Pirolli, **Shiwali Mohan**, Anusha Venkatakrishnan, Len Nelson, Michael Silva, Aaron Springer. *Journal of Medical Information Research*. 2017.

[J6] John E Laird, Kevin Gluck, John Anderson, Kenneth D Forbus, Odest Chadwicke Jenkins, Christian Lebiere, Dario Salvucci, Matthias Scheutz, Andrea Thomaz, Greg Trafton, Robert E Wray, **Shiwali Mohan**, James R Kirk. Interactive Task Learning. *IEEE Intelligent Systems*, Volume 32, Issue 4, IEEE 2017.

[J7] **Shiwali Mohan**, Aaron Mininger, and John Laird. Towards an Indexical model of Situated Comprehension for Real-World Cognitive Agents. *Advances in Cognitive Systems 3*, ACS 2014.

[J8] John Laird and **Shiwali Mohan**. A Case Study of Knowledge Integration Across Multiple Memories in Soar. *Biologically Inspired Cognitive Architectures* (invited), BICA 2014.

[J9] **Shiwali Mohan**, Aaron Mininger, James Kirk, and John Laird. Acquiring Grounded Representations of Words with Situated Interactive Instruction. *Advances in Cognitive Systems 2*, ACS 2012.

Conference

[C1] **Shiwali Mohan**, Frances Yan, Victoria Bellotti, Hesham Rakha, Matthew Klenk, On Influencing Individual Behavior for Reducing Transportation Energy Expenditure in a Large Population. *In Proceedings of the* 2^{nd} *AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society*. AIES 2019.

[C2] John Laird and **Shiwali Mohan**. Learning Fast and Slow: Levels of Learning in General Autonomous Intelligent Agents. *In Proceedings of the* 32^{nd} *AAAI Conference on Artificial Intelligence*. AAAI 2018.

[C3] **Shiwali Mohan**, Anusha Venkatakrishnan, Michael Silva, and Peter Pirolli. On Designing a Social Coach to Promote Regular Aerobic Exercise. *In the Proceedings of the 29th Annual Conference on Innovative Applications of Artificial Intelligence/AAAI*, IAAI 2017.

[C4] Justin Li, Steven Jones, **Shiwali Mohan**, and Nate Derbinksy. Architectural Mechanisms for Mitigating Uncertainty during Long-Term Declarative Knowledge Access. *In the Proceedings of the 4th Conference on Advances in Cognitive Systems*, ACS 2016.

[C5] Andrea L Hartzler*, Anusha Venkatakrishnan*, **Shiwali Mohan**, Michael Silva, Paula Lozano, James D Ralston, Evette Ludman, Dori Rosenberg, Katherine M Newton, Lester Nelson, Peter Pirolli. Acceptability of a Team-Based Mobile Health (mHealth) Application for Lifestlye Self-Management in Individuals with Chronic Illnesses. *In* 38^{th} *Annual International Conference of the Engineering in Medicine and Biology Society (EMBC)*, IEEE. 2016.

[C6] **Shiwali Mohan** and John Laird. Learning Goal-Oriented Hierarchical Tasks from Situated Interactive Instruction. *In the Proceedings of the* 28^{th} *AAAI Conference*, AAAI 2014.

[C7] **Shiwali Mohan**, James Kirk, and John Laird. A Computational Model of Situated Task Learning with Interactive Instruction. *In Proceedings of the* 17^{th} *International Conference on Computational Modeling*, ICCM 2013.

[C8] Mandar Joshi, Rakesh Khobragade, Saurabh Sarda, Umesh Deshpande, and **Shiwali Mohan**. Object-Oriented Representation and Hierarchical Reinforcement Learning in Infinite Mario. *In Proceedings of the* 24^{th} *IEEE International Conference on Tools with Artificial Intelligence*, ICTAI 2012.

[C9] **Shiwali Mohan** and John Laird. An Object-Oriented Approach to Reinforcement Learning in an Action Game. *In Proceedings of the* 7^{th} *Artificial Intelligence for Interactive Digital Entertainment Conference*, AIIDE 2011.

[C10] Niladri Chatterjee and **Shiwali Mohan**. Discovering Word Senses from Text using Random Indexing. *In Proceedings of the* 9^{th} *International Conference on Computational linguistics and Intelligent Text Processing*, CICLing 2008.

[C11] Niladri Chatterjee and **Shiwali Mohan**. Extraction-based Single-Document Summarization Using Random Indexing. *In Proceeding of the* 19^{th} *IEEE International Conference on Tools with Artificial Intelligence*, ICTAI 2007.

Symposia, Workshops

[W1] **Shiwali Mohan**, Matthew Klenk, Victoria Belloti. Exploring How to Personalize Travel Mode Recommendations For Urban Transportation. *Under review*. 2019

[W2] **Shiwali Mohan**, Kalai Ramea, Bob Price, Matthew Shreve, Hoda Eldardiry. Building JARVIS: A Learner-Aware Conversational Trainer.*Under review*. 2019.

[W3] Filip Dvorak, **Shiwali Mohan**, Victoria Bellotti, Matthew Klenk. Collaborative Optimization and Planning for Transportation Energy Reduction. *ICAPS Proceedings of the 6th Workshop on Distributed and Multi-Agent Planning*. 2018.

[W4] **Shiwali Mohan**, Anusha Venkatakrishnan, Daniel Bobrow, Peter Pirolli. Health Behavior Change: A Motivating Domain for Human-Aware AI Research. *In Proceeding of the AAAI 2017 Workshops*. AAAI 2017.

[W5] Matthew Klenk, **Shiwali Mohan**, Johan de Kleer, Daniel Bobrow, Tom Hinrichs, Ken Forbus. Collaborative Autonomy Through Analogical Comic Graphs. *In Proceedings of AAAI 2017 Workshops*. AAAI 2017.

[W6] John E. Laird and **Shiwali Mohan**. A Case Study of Knowledge Integration Across Multiple Memories in Soar. *In Papers from the AAAI Fall Symposium Series on Integrated Cognition*, 2013.

[W7] **Shiwali Mohan***, Aaron Mininger*, James Kirk*, and John Laird. Learning Grounded Language Through Situated Interactive Instruction. *In Papers from the AAAI Fall Symposium Series on Robots Learning Interactively from Human Teachers*, 2012.

[W8] John Laird, Keegan Kinkade, **Shiwali Mohan**, and Joseph Xu. Cognitive Robotics Using the Soar Cognitive Architecture. *In Proceedings of the 8th International Cognitive Robotics Workshop*, 2012.

[W9] **Shiwali Mohan** and John Laird. Situated Comprehension of Imperative Sentences in Embodied, Cognitive Agents. *In Papers from the AAAI Workshop on Grounding Language for Physical Systems*, 2012.

[W10] **Shiwali Mohan** and John Laird. Towards Situated, Interactive, Instructable Agents in a Cognitive Architecture. *In Papers from the AAAI Fall Symposium Series on Advances in Cognitive Systems*, 2011.

Extended Abstracts

[A1] Peter Pirolli, **Shiwali Mohan**, Rong Yang, Anusha Venkatakrishnan, Michael Silva, Michael Youngblood, Ashwin Ram and Les Nelson. User Modeling and Planning for Improving Self-efficacy and Goal Adherence in mHealth. *Frontiers Public Health. Conference Abstract: 2nd Behaviour Change Conference: Digital Health and Wellbeing.*, 2016.

[A2] **Shiwali Mohan**, and John E. Laird. Learning New Tasks for Situated Interactive Instruction. *In the 2014 HRI Pioneers Workshop at Human-Robot Interaction*, 2014.

[A3] Mandar Joshi, Rakesh Khobragade, Saurabh Sarda, Umesh Deshpande, and **Shiwali Mohan**. Hierarchical Action selection for Reinforcement Learning in Infinite Mario. *In Proceedings of the 6th Starting Artificial Intelligence Research Symposium at European Conference on Artificial Intelligence*, STAIRS 2012.

[A4] **Shiwali Mohan** and John Laird. Learning Actions and Action Verbs from Human-Agent Interaction. *In Proceedings of the 26th AAAI Conference on Artificial Intelligence*, AAAI 2012.

[A5] **Shiwali Mohan** and John Laird. Exploring Mixed-Initiative Interaction for Learning with Situated Instruction in Cognitive Agents. *In Proceedings of the 26th AAAI Conference on Artificial Intelligence*, AAAI 2012.

[A6] **Shiwali Mohan** and John Laird. Relational Reinforcement Learning in Infinite Mario. *In Proceedings of the 24th AAAI Conference on Artificial Intelligence*, AAAI 2010.

Patents

2018, USA

Matthew Klenk, Shiwali Mohan, Victoria Bellotti, *Transportation Behavior Influence*. Application number 16/181152. Filing date: 2018/11/05.

2016, European

Ashwin Ram, Gregory Michael Youngblood, Lester D Nelson, Anusha Venkatakrishnan, Peter L Pirolli, Michael K Silva, Shiwali Mohan. *System and Method to Create, Monitor, and Adapt*

Individualized Multidimensional Health Programs. Application number: 17165632.5 Publication date: 2017/04/07.

2016, USA Ashwin Ram, Gregory Michael Youngblood, Lester D Nelson, Anusha Venkatakrishnan, Peter L Pirolli, Michael K Silva, Shiwali Mohan. *System and Method to Create, Monitor, and Adapt Individualized Multidimensional Health Programs*. Application number: 15/130,770. Publication date: 2016/4/15.

Invited Talks, Workshops, & Panels

November 2017 NSF Workshop on Interactive Cognitive Assistants

May 2017 Ernst Strunngmann Forum on Interactive Task Learning

September 2015 *On Designing a Programmable Cognitive Assistant*
IBM Cognitive Systems Institute

December 2013 *Learning Hierarchical Tasks with Situated Interactive Instruction*
University of Southern California

Media

2017 *Could a Bot Coach You to a New PR? Artificial intelligence is making its way into fitness apps*. Interview. Outside magazine

Service

2019 *Program Committee*: IUI, AAAI, AAAI Doctoral Consortium, *Reviewer*: Transactions of Intelligent Interactive Systems

2018 *Program Committee*: ICRA, HRI, IUI, AAAI, AAAI Doctoral Consortium, *Reviewer*: Autonomous Robots

2017 *Program Committee*: AAAI, AAAI Doctoral Consortium

2016 *Program Committee*: IJCAI, AAAI

2015 *Program Committee*: AI-HRI AAAI Fall Symposium Series

2015 *Organizing Committee*: Students of Cognitive Systems at ACS

December 16, 2018