

Shiwali Mohan

CONTACT INFORMATION

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RESEARCH INTERESTS

Interactive intelligence, cognitive agents, robots, and systems, language processing for intelligent agents, interactive knowledge acquisition, cognitive modeling.

EDUCATION

University of Michigan, Ann Arbor, MI USA
Ph.D., Computer Science and Engineering 2008 - 2015

University of Michigan, Ann Arbor, MI USA
M.S.E., Computer Science and Engineering 2008 - 2009

University of Delhi, New Delhi, India
Netaji Subhas Institute of Technology
B.E., Instrumentation and Control Engineering 2003 - 2007

EMPLOYMENT

Palo Alto Research Center, Palo Alto, CA USA
Researcher, Interactive Intelligence Area November 2014 - present
Agents for Health Behavior Change

- Developing cognitive models of skill learning, prospective memory, and habit formation.
- Developing interactive intelligent agents that use these models to generate interventions for behavior change.

Call Center Automation

- Developing knowledge-rich machine learning methods to extract procedural knowledge from semi-structured text.

University of Michigan, Ann Arbor, MI USA
Graduate Student Research Assistant to John E. Laird August 2010 - 2014
Situated Interactive Instruction

- Introduced a novel mixed-modality representation for action verbs.
- Proposed, developed, and analyzed the Indexical Model of situated language comprehension.
- Proposed, developed, and analyzed explanation-based learning (EBL) methods for general task learning.

Reinforcement Learning

- Proposed relational representations for RL in Infinite Mario.
- Developed representational and action hierarchies for efficient learning.

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.

Journal Articles

- [J1] **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.
- [J2] John Laird and **Shiwali Mohan**. A case study of knowledge integration across multiple memories in Soar. *Biologically Inspired Cognitive Architectures* (invited), BICA 2014.
- [J3] **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 Proceedings

- [C1] **Shiwali Mohan** and John Laird. Learning goal-oriented hierarchical tasks from situated interactive instruction. *In the Proceedings of the 28th AAAI Conference*, AAAI 2014.
- [C2] **Shiwali Mohan**, Aaron Mininger, and John Laird. Towards an Indexical model of situated comprehension for real-world cognitive agents. *In Proceedings of the 2nd Conference on Advances in Cognitive Systems*, ACS 2013.
- [C3] **Shiwali Mohan**, James Kirk, and John Laird. A computational model of situated task learning with interactive instruction. *In Proceedings of the 17th International Conference on Computational Modeling*, ICCM 2013.
- [C4] 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 24th IEEE International Conference on Tools with Artificial Intelligence*, ICTAI 2012.
- [C5] **Shiwali Mohan** and John Laird. An Object-Oriented approach to reinforcement learning in an action game. *In Proceedings of the 7th Artificial Intelligence for Interactive Digital Entertainment Conference*, AIIDE 2011.
- [C6] Niladri Chatterjee and **Shiwali Mohan**. Discovering word senses from text using random indexing. *In Proceedings of the 9th International Conference on Computational linguistics and Intelligent Text Processing*, CICLing 2008. Best Paper Award.
- [C7] Niladri Chatterjee and **Shiwali Mohan**. Extraction-based single-document summarization using random indexing. *In Proceeding of the 19th IEEE International Conference on Tools with Artificial Intelligence*, ICTAI 2007.

Refereed Symposia/Workshop Proceedings

- [W1]: 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.

- [W2]: **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.
- [W3]: 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.
- [W4]: **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.
- [W5]: **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.

Refereed Extended Abstracts

- [A1] **Shiwali Mohan**, and John E. Laird. Learning new tasks for situated interactive instruction. *In the 2014 HRI Pioneers Workshop at Human-Robot Interaction*, 2014.
- [A2] 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.
- [A3] **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.
- [A4] **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.
- [A5] **Shiwali Mohan** and John Laird. Relational reinforcement learning in Infinite Mario. *In Proceedings of the 24th AAAI Conference on Artificial Intelligence*, AAAI 2010.

INVITED TALKS	On Designing a Programmable Cognitive Assistant	
	IBM Cognitive Systems Institute	September 2015
	Learning Hierarchical Tasks with Situated Interactive Instruction	
	Center for Vision, Cognition, Learning, and Art, UCLA	November 2013
	USC Institute for Creative Technologies.	November 2013
SERVICE	Interaction Lab, Computer Science and Engineering, USC	December 2013
	Information Sciences Institute, Los Angeles	December 2013
HONORS AND AWARDS	<i>Organizing Committee</i> , Students of Cognitive Systems at ACS	2015
	<i>Reviewer</i> AI-HRI AAAI Fall Symposium Series 2015, AAAI 2016	
	HRI Pioneers Scholarship, 2014	
	AAAI Travel Grant, AAAI Fall Symposium Series: 2013	
	Doctoral Consortium Scholarship, AAAI: 2012	
	Rackham Travel Grant: 2011, 2012, 2013	

Best Paper Award, CICLing: 2008
Scholarship for Academic Excellence at the University of Delhi: 2003 - 2007

TEACHING
EXPERIENCE

University of Michigan, Ann Arbor, MI, USA
Guest Lecturer: Cognition and Interactive Systems
EECS 498: Intelligent Interactive Systems

April 2014

University of Michigan, Ann Arbor, MI, USA
Graduate Student Instructor
EECS 492: Introduction to Artificial Intelligence

January 2012 - April 2012

ADVISING
EXPERIENCE

Bharati Vidyapeeth College of Engineering, New Delhi, India
Senior thesis: *Designing Soar agents for planet wars*
Students: Anant Mittal, Anmol Gupta

September 2012 - Present

Visvesvaraya National Institute of Technology, Nagpur, India
Senior thesis: *Reinforcement learning agents for Infinite Mario*
Students: Mandar Joshi, Rakesh Khobragade, Saurabh Sarda

September 2011 - May 2012