

Shiwali Mohan

CONTACT INFORMATION	Bob & Betty Beyster Building, #3844 Computer Science and Engineering University of Michigan Ann Arbor, MI 48105 USA	<i>work:</i> (734) 763-0120 <i>cell:</i> (734) 757-0354 <i>email:</i> shiwali@umich.edu <i>url:</i> www.shiwali.me
RESEARCH INTERESTS	Cognitive systems and agents, situated language for agents, learning with human-agent interaction, natural language semantics, knowledge representation and reasoning, interactive knowledge acquisition, cognitive robotics.	
EDUCATION	University of Michigan, Ann Arbor, MI USA Ph.D., Computer Science and Engineering 2008 - 2014 (expected) Thesis (in progress): <i>Learning Tasks and Verbs from Situated Interactive Instruction</i> Thesis Advisor: John Laird Thesis Committee: Edmund Durfee, Richard Lewis, Edwin Olson, Andrea Thomaz	
	University of Michigan, Ann Arbor, MI USA M.S.E., Computer Science and Engineering 2008 - 2009	
	University of Delhi, New Delhi, India <i>Netaji Subhas Institute of Technology</i> B.Tech, Instrumentation and Control Engineering 2003 - 2007 Senior Thesis: <i>Extraction-based Single Document Summarization</i>	
HONORS AND AWARDS	Doctoral Consortium Travel 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	
RESEARCH EXPERIENCE	University of Michigan, Ann Arbor, MI USA Graduate Student Research Assistant to John E. Laird August 2010 - present <i>Learning tasks with situated interactive instruction</i> Studying linguistic interaction and knowledge-intensive learning paradigms useful in acquiring novel tasks for collaborative cognitive agents. <i>Situated language for embodied agents</i> Investigating situated language comprehension models that generate meanings by associating amodal linguistic symbols with modal perceptual, spatial, and task knowledge. Studying the role of non-linguistic context and domain knowledge in linguistic comprehension. University of Michigan, Ann Arbor, MI USA Graduate Student Research Assistant to John E. Laird January 2009 - August 2010 <i>Reinforcement learning in Soar cognitive architecture</i> Designed, implemented, and analyzed reinforcement learning agents for Infinite Mario. Formu-	

lated and implemented modular reinforcement learning for Soar cognitive architecture that allows the agent to simultaneously learn multiple MDPs.

Indian Institute of Technology, New Delhi, India

Research Assistant to Niladri Chatterjee

May 2007 - July 2007

Sense disambiguation, Word-Space models for language

Designed, implemented, and analyzed algorithm for sense disambiguation of homonyms using K-Means clustering and Random Indexing.

University of Delhi, New Delhi, India

Thesis with Shampa Chakravarty, Niladri Chatterjee

December 2006 - May 2007

Single document summarization, Word-Space models for language

Designed, implemented, and analyzed algorithms for single-document summarization using PageRank and Random Indexing.

PUBLICATIONS

Journal Articles

J1: **Shiwali Mohan**, Aaron Mininger, James Kirk, and John Laird. Acquiring grounded representations of words with situated interactive instruction. *Advances in Cognitive Systems*, 2012

Conference Proceedings

C1: **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*, 2013

C2: **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*, 2013

C3: 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

C4: **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

C5: 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

C6: 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 *AAAI Fall Symposium on Integrated Cognition*, 2013

W2: **Shiwali Mohan***, Aaron Mininger*, James Kirk*, and John Laird. Learning grounded language through situated interactive instruction. In *Papers from Robots Learning Interactively from Human Teachers (AAAI Fall Symposium Series)*, 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 the AAAI 2012 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 2011 AAAI Fall Symposium Series, 2011

Extended Abstracts

- A1: 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 (ECAI), 2012
- A2: **Shiwali Mohan** and John Laird. Learning actions and action verbs from human-agent interaction. In Proceedings of the 26th AAAI Conference on Artificial Intelligence, 2012
- A3: **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, 2012
- A4: **Shiwali Mohan** and John Laird. Relational reinforcement learning in Infinite Mario. In Proceedings of the 24th AAAI Conference on Artificial Intelligence, AAAI, 2010

TEACHING EXPERIENCE

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

January 2012 - April 2012

University of Michigan, Ann Arbor, MI, USA
Student
 EECS 580: Teaching Engineering

September 2011 - December 2011

ADVISING EXPERIENCE

Undergraduate Student Advising
 Anant Mittal, Anmol Gupta
 Undergraduate thesis project: *Designing Soar agents for planet wars*
Bharati Vidyapeeth College of Engineering, New Delhi, India

September 2012 - Present

Undergraduate Student Advising
 Mandar Joshi, Rakesh Khobragade, Saurabh Sarda
 Undergraduate thesis project: *Reinforcement learning agents for Infinite Mario*
Visvesvaraya National Institute of Technology, Nagpur, India

September 2011 - May 2012

TALKS

Learning Hierarchical Tasks with Situated Interactive Instruction
 Center for Vision, Cognition, Learning, and Art, UCLA
 USC Institute for Creative Technologies.
 Interaction Lab, Computer Science and Engineering, USC
 Information Sciences Institute, Los Angeles

November 2012
 November 2012
 December 2012
 December 2012

SERVICE	Co-Chair, Special Interest Group - Faculty, University of Michigan	2013
	Co-Chair, Special Interest Group - Faculty, University of Michigan	2012
	Vice-President, CSE Graduate Organization, University of Michigan	2011
	Social Chair, Indian Students Association, University of Michigan	2011
	DCO Representative, CSE Graduate Organization, University of Michigan	2010
	Social Chair, Indian Students Association, University of Michigan	2010
INDUSTRY	Yahoo! Research and Development, Bangalore, India	
EXPERIENCE	Software Engineer with Strategic Data Services	July 2007 - July 2008
	Implemented feed aggregation to generate analytic numbers such as page views and click-through rate for many Yahoo! websites on a custom distributed computing platform. Implemented better scheduling of I/O and CPU bound processes leading to performance improvement of feed analytics processes.	
	Bharat Electronics Limited, Ghaziabad, India	
	Software Intern	May 2006 - July 2006
	Central Research Laboratory, Ghaziabad, India	
	Software Intern	May 2005 - July 2006
TECHNICAL SKILLS	<ul style="list-style-type: none"> • Experience with cognitive architectures Soar and ACT-R • Experience in programming with Java, C++, Perl, Python, JavaScript • Operating Systems: Unix/Linux, Windows. 	
RECOMMENDERS	RECOMMENDERS	
AND		
REFERENCES	John E. Laird <i>John L. Tishman Professor of Engineering</i> Computer Science and Engineering, University of Michigan, Ann Arbor 2260 Hayward Street Ann Arbor, MI 48109-2121 ✉: laird@umich.edu	John E. Laird <i>John L. Tishman Professor of Engineering</i> Computer Science and Engineering, University of Michigan, Ann Arbor 2260 Hayward Street Ann Arbor, MI 48109-2121 ✉: laird@umich.edu
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