

Shiwali Mohan

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Ph.D. in *Computer Science and Engineering*

August 2009 - August 2014 (expected)

University of Michigan, Ann Arbor

Thesis: Learning to ground verbs in actions through situated interactive instruction for cognitive agents embodied in physical worlds.

Areas of interest: linguistic human-agent interaction, learning from human-agent interaction, embodied language processing, cognitive architectures and agents.

M.S.E in *Computer Science and Engineering*

August 2008 - December 2009

University of Michigan, Ann Arbor

Relevant coursework: Introductory/Advanced Artificial Intelligence, Machine Learning, Natural Language Processing, Models of Cognition, Cognitive Functioning, Algorithms, Parallel Computing, Psychology of Language

B.E. in *Instrumentation and Control Engineering*

August 2003 - May 2007

Netaji Subhas Institute of Technology, **Delhi University**, New Delhi, India

Thesis: Extraction based summarization of documents

Graduate Student Research Assistant to Professor John E. Laird

August 2010 - Present

University of Michigan, Ann Arbor

Learning with human-agent interaction

Studying interaction and learning paradigms for collaborative intelligent agents embedded in physical worlds that are useful in acquiring novel task knowledge.

Grounded language for physical agents

Investigating situated language comprehension models that generate meanings by associating amodal linguistic symbols with modal perceptual, spatial, and task knowledge.

Graduate Student Research Assistant to Professor John E. Laird

May 2009 - August 2010

University of Michigan, Ann Arbor

Reinforcement learning in Soar cognitive architecture

Designed, implemented, and analyzed reinforcement learning agents for Infinite Mario. Implemented modular reinforcement learning for Soar cognitive architecture that allows the agent to simultaneously learn multiple MDPs.

Research Assistant to Professor Niladri Chatterjee

May 2007 - May 2007

Indian Institute of Technology, New Delhi, India

Sense disambiguation, Word-Space models for language

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

Undergraduate Thesis with Professor Niladri Chatterjee

December 2006 - May 2007

Indian Institute of Technology, New Delhi, India

Single document summarization, Word-Space models for language

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

Journal Articles

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

Conference/Workshop Proceedings

John E. Laird and **Shiwali Mohan**. A case study of knowledge integration across multiple memories in Soar. In *(to appear) in AAAI Fall Symposium on Integrated Cognition*, 2013

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

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

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

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

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

Shiwali Mohan and John Laird. Towards situated, interactive, instructable agents in a cognitive architecture. In *Papers from the 2011 AAAI Fall Symposium Series*, 2011

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

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**

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

Short Papers and Extended Abstracts

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

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

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

Shiwali Mohan and John Laird. Relational reinforcement learning in Infinite Mario. In *Proceedings of the 24th AAAI Conference on Artificial Intelligence*, AAAI, 2010

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

January 2012 - April 2012

Student
CHE 580: Teaching Engineering
University of Michigan

September 2011 - December 2011

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

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- 2013 *Co-Chair*, Special Interest Group - Faculty, University of Michigan
 - 2012 *Co-Chair*, Special Interest Group - Faculty, University of Michigan
 - 2011 *Vice-President*, CSE Graduate Organization, University of Michigan
Social Chair, Indian Students Association, University of Michigan
 - 2010 *DCO Representative*, CSE Graduate Organization, University of Michigan
Social Chair, Indian Students Association, University of Michigan
 - 2007 *Creative Head*, The Choreography Team, Netaji Subhas Institute of Technology, Delhi
 - 2006 *Volunteer*, The Neighborhood Project, Netaji Subhas Institute of Technology, Delhi

Software Engineer with Strategic Data Services

July 2007 - July 2008

Yahoo! Research and Development, India

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.

Software Intern

May 2006 - July 2006

Bharat Electronics Limited, India

Software Intern

May 2005 - July 2005

Central Research Laboratory, Bharat Electronics Limited, India

Operating Systems: Linux(Ubuntu/Red Hat), Windows(XP/Vista/7)

Programming Languages: C, C++, Perl, Soar, Python, JavaScript

Document Markup Language: Latex

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