

## Hema Swetha Koppula

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<b>Interests</b>	My research lies at the intersection of computer vision, machine learning and robotics. I am interested in developing algorithms for understanding human environments and human activities for enabling assistive robots to work with and around people. I employ a combination of machine learning techniques for achieving this goal.	
<b>Education</b>	<b>Stanford University</b> , Stanford, California, USA	(August 2014 - Present)
	Visiting Ph.D. student in AI Lab	
	<b>Cornell University</b> , Ithaca, New York, USA	(August 2010 - Present)
	Ph.D. student, Computer Science	
	<ul style="list-style-type: none"><li>• Advisor: Prof. Ashutosh Saxena</li><li>• Thesis: Understanding People From RGBD Data For Assistive Robots</li></ul>	
	<b>Indian Institute of Technology</b> , Kharagpur, West Bengal, India	(2003 - 2008)
	B.Tech.(H) and M.Tech., Computer Science and Engineering	
	<ul style="list-style-type: none"><li>• Advisor: Prof. Niloy Ganguly</li><li>• Thesis: Study and Improvement of Robustness of Overlay Networks</li></ul>	
<b>Achievements And Honors</b>	<ul style="list-style-type: none"><li>• Google PhD Fellowship in Machine Perception, 2014</li><li>• Finalist, Best Reviewer Award, Robotics: Science and Systems, 2014</li><li>• Best Student Paper Award and Best Paper Award Runner-up, Robotics: Science and Systems, 2013</li><li>• Finalist, Google Anita Borg Memorial Scholarship, 2012</li><li>• Recipient of Yahoo!'s You Rock! team award for Q4 2009</li><li>• Won Yahoo! Bangalore's Technical Paper Writing Competition, TechPACO 2009</li><li>• Prathibha Scholarship and a Gold Medal by the Govt. of Andhra Pradesh, 2003-2007</li><li>• Won Second Prize in the Loadstones, Annual Autonomous Robotics Competition, IIT Kharagpur, 2005</li><li>• Silver Medal, 30<sup>th</sup> Mathematical Olympiad, Andhra Pradesh, 2002</li></ul>	
<b>Journal Publications</b>	H. S. Koppula and A. Saxena. <i>Anticipating Human Activities using Object Affordances for Reactive Robotic Response</i> . In IEEE Transactions in Pattern Analysis and Machine Intelligence (TPAMI), 2015.	
	H. S. Koppula, R. Gupta and A. Saxena. <i>Learning Human Activities and Object Affordances from RGB-D Videos</i> . In International Journal of Robotics Research (IJRR), 2013.	
	H. S. Koppula, A. Anand, T. Joachims and A. Saxena. <i>Contextually Guided Semantic Labeling and Search for 3D Point Clouds</i> . In International Journal of Robotics Research (IJRR), 2012.	

## Conference Publications

- H. S. Koppula and A. Saxena. *Physically Grounded Spatio-Temporal Object Affordances*. In European Conference on Computer Vision (ECCV), 2014.
- H. S. Koppula, A. Jain and A. Saxena. *Anticipatory Planning for Human-Robot Teams*. In International Symposium on Experimental Robotics (ISER), 2014.
- H. S. Koppula and A. Saxena. *Anticipating Human Activities using Object Affordances for Reactive Robotic Response*. In Robotics: Science and Systems (RSS), 2013. (**best student paper award**)
- H. S. Koppula and A. Saxena. *Learning Spatio-Temporal Structure from RGB-D Videos for Human Activity Detection and Anticipation*. In International Conference on Machine Learning (ICML), 2013.
- Y. Jiang, H. S. Koppula, and A. Saxena. *Hallucinated Humans as the Hidden Context for Labeling 3D Scenes*. In Conference on Computer Vision and Pattern Recognition (CVPR), 2013. (oral)
- H. S. Koppula, A. Anand, T. Joachims and A. Saxena. *Semantic Labeling of 3D Point Clouds for Indoor Scenes*. In Neural Information Processing Systems (NIPS), 2011.
- J. Ajmera, H. S. Koppula, K. P. Leela, S. Mukherjee and M. Parsana. *Alignment of short length parallel corpora with an application to web search*. In International Conference on Information and Knowledge Management (CIKM) 2010.
- H. S. Koppula, K. P. Leela, A. Agarwal, K. P. Chitrapura, S. Garg and A. Sasturkar . *Learning URL Patterns for Webpage De-duplication*. In International Conference on Web Search and Data Mining (WSDM), 2010.
- A. Agarwal, H. S. Koppula, K. P. Leela, K. P. Chitrapura, S. Garg and P. Kumar. *URL Normalization for De-duplication of Web Pages*. In International Conference on Information and Knowledge Management (CIKM), 2009.

## Workshop Publications

- H. S. Koppula and A. Saxena. *Anticipating the Future By Constructing Human Activities using Object Affordances*. In NIPS workshop on Constructive Machine Learning , 2013.
- H. S. Koppula and A. Saxena. *Anticipating Human Activities using Object Affordances for Reactive Robotic Response*. In ICML workshop on Robot Learning , 2013.
- H. S. Koppula, A. Anand, T. Joachims and A. Saxena. *Labeling 3D Scenes for Personal Assistant Robots*. In RSS workshop on RGB-D cameras, 2011.
- A. Mislove, H. S. Koppula, K. P. Gummadi, P. Druschel and B. Bhattacharjee. *Growth of the Flickr Social Network*. In ACM SIGCOMM Workshop on Social Networks (WOSN), 2008.

## Papers in Submission

- A. Jain, H. S. Koppula, B. Raghavan and A. Saxena. *Know Before You Do: Anticipating Maneuvers via Learning Temporal Driving Models*. ArXiv, April 2015.
- A. Saxena, A. Jain, O. Sener, A. Jami, D. K. Misra and H. S. Koppula. *RoboBrain: Large-Scale Knowledge Engine for Robots*. ArXiv, April 2015.
- Y. Jiang, H. S. Koppula, and A. Saxena. *Modeling 3D Environments through Hidden Human*

*Context.* Under Review at IEEE Transactions in Pattern Analysis and Machine Intelligence.

## Professional Experience

**Google**, Mountain View, USA (Summer 2014)

Intern, Machine Perception Team

- Mentor: Kevin P. Murphy
- Generative modeling for human activity understanding from RGBD videos

**Yahoo! Labs**, Bangalore, India (2008-2010)

Research Engineer, Advertising Sciences Team

- Query-rewrite ranking for Sponsored Search
- Learning normalization rules for webpage de-duplication

**Max Planck Institute for Software Systems**, Saarbrücken, Germany (Summer 2007)

Research Intern, Networked Systems Group

- Mentors: Dr. Alan Mislove and Prof. Krishna Gummadi
- Growth models for online social networks like Flickr, Youtube, Orkut, Wikipedia

**Synopsys Pvt. Ltd.**, Bangalore, India (Summer 2006)

Summer Intern, IC Compiler Team

- Memory and runtime profiling of IC Compiler
- Verification of Interface Logic Modeling

## Teaching Experience

**Cornell University**, Ithaca, NY, USA (2010-present)

Teaching Assistant, Computer Science Department

- CS 6758: Robot Learning, Spring 2012
- CS 1132: Transition to MATLAB, Spring 2011
- CS 1110: Introduction to Computing Using Java, Fall 2010

**Indian Institute of Technology**, Kharagpur, West Bengal, India (2007-2008)

Teaching Assistant, Computer Science Department

- CS23002: Switching Circuits and Logic Design, Spring 2008
- CS43009: Compiler Design, Fall 2007

## Mentoring

**Rudhir Gupta**, Master's Thesis (won the 2012-2013 CS M.Eng Project Award)

**Hakim Sidahmed**, Internship at Robot Learning Lab, Cornell

## Other Activities

Workshop Organizer for RGB-D: Advanced Reasoning with Depth Cameras, 2013 & 2014

Reviewer for NIPS, ICML, CVPR, RSS, ICRA, IROS and AURO

Admin for Machine Learning Discussion Group, Cornell University, 2013-2014

Organizing Head and Coordinator, Robotix, IIT Kharagpur, 2005-2007

Head, Embedded Hardware Group, Kharagpur Robotics and Artificial Intelligence Group (KRAIG), IIT Kharagpur, 2005-2006

Library General Secretary, IG Hall of Residence, IIT Kharagpur, 2004-2006

Captain of OpenSoft, Inter-hall Software Competition, for SN, IG and MBM Halls of Residence, IIT Kharagpur, 2006-2007

Silver winning team, Fine Frenzy, Annual Fashion Parade Competition, IIT Kharagpur, 2007