

# Roozbeh Mottaghi

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## CONTACT INFORMATION

Allen Institute for AI  
Seattle, WA

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## EDUCATION

**University of California-Los Angeles**, Los Angeles, California USA

PhD., Computer Science **Sep 2008 to Sep 2013**  
Advisor: Alan Yuille (since 2009)

**Georgia Institute of Technology**, Atlanta, Georgia USA

M.Sc., Computer Science **Aug 2006 to Aug 2008**

**Simon Fraser University**, Burnaby, British Columbia Canada

M.A.Sc., Engineering Science **Sep 2003 to Apr 2006**

**Sharif University of Technology**, Tehran, Iran

B.Sc., Computer Engineering **Sep 1999 to Jul 2003**

## AWARDS & HONORS

- Outstanding Reviewer Award, CVPR 2017.
- Graduate Fellowship, University of California, Los Angeles, 2008-2009.
- The only recipient of Marshall D. Williamson Fellowship, Georgia Institute of Technology, 2007.
- Cy and Emerald Keyes Graduate Scholarship in Expert Systems, Simon Fraser University, 2006.
- Graduate Fellowship, Simon Fraser University, 2004.
- Clark, Wilson Graduate Scholarship in Expert Systems, Simon Fraser University, 2004.
- Ranked under 100 in Iran National University Entrance Examination among 400,000 students, 1999.

## RESEARCH EXPERIENCE

**Allen Institute for Artificial Intelligence (AI2)**

*Research Scientist* **Jan 2015 to now**

**Vicarious**

*Senior Researcher* **Oct 2014 to Dec 2014**

**Computational Vision and Geometry Lab, Stanford University**

*Postdoctoral Researcher* **Sep 2013 to Sep 2014**

- Worked on methods for 3D scene understanding and pose estimation.

**Toyota Technological Institute, Chicago, Illinois**

*Visiting Student*

**Sep 2012 to Nov 2012**

- Proposed a new approach for object detection, which combined bottom-up grouping with top-down detection. This approach achieved the state-of-the-art performance on PASCAL dataset, which is the main dataset for object detection in the vision community.

**Toyota Technological Institute, Chicago, Illinois**

*Research Intern*

**Jan 2012 to Apr 2012**

- Developed hybrid human-machine CRF models to identify the bottlenecks in machine scene understanding.

**Center for Cognition, Vision, and Learning, UCLA  
(formerly: Center for Image and Vision Science)**

*Research Assistant*

**Jul 2009 to Sep 2013**

- Developed efficient learning and inference methods for hierarchical Markov Random Fields used for object detection.
- Developed techniques for learning rich description of objects. The goal is to go beyond the traditional bounding box representation and describe objects in terms of their silhouette and parts.

**Honda Research Institute, Mountain View, California**

*Summer Intern*

**Jun 2010 to Sep 2010**

- Developed a compositional generative method to learn part-based models of objects. The goal was simultaneous learning of the structure and the parameters of the object model.

**Center for Embedded Networked Sensing (CENS), UCLA**

*Research Assistant*

**Jan 2009 to Jun 2009**

- Developed a vision-based method to estimate the traffic flow on streets.

**BORG lab, College of Computing, Georgia Institute of Technology**

*Research Assistant*

**Aug 2006 to May 2008**

- Member of LAGR (Learning Applied to Ground Robots) team.
- Developed a visual place learning and recognition method for robot localization.

**Autonomy lab, School of Computing Science, Simon Fraser University**

*Research Assistant*

**Jan 2004 to Apr 2006**

- Developed a probabilistic reasoning method based on particle filters to track multiple targets in presence of long-term occlusions.

**Robocup lab, Sharif University of Technology**

*Research Assistant*

**Sep 2000 to Jun 2003**

- Member of SharifCESR small size soccer playing robots which participated in 2001 and 2002 Robocup world championship competitions in the United States and Japan.

PUBLICATIONS

Y. Zhu\*, D. Gordon\*, E. Kolve, D. Fox, L. Fei-Fei, A. Gupta, **R. Mottaghi**, and A. Farhadi. **Visual Semantic Planning using Deep Successor Representations**, in International Conference on Computer Vision (ICCV), 2017. (\* Equal contribution)

**R. Mottaghi**, C. Schenck, D. Fox, and A. Farhadi. **See the Glass Half Full: Reasoning about Liquid Containers, their Volume and Content**, in International Conference on Computer Vision (ICCV), 2017.

Y. Zhu, **R. Mottaghi**, E. Kolve, J. Lim, A. Gupta, L. Fei-Fei, and A. Farhadi. **Target-driven Visual Navigation in Indoor Scenes using Deep Reinforcement Learning**, in International Conference on Robotics and Automation (ICRA), 2017.

**R. Mottaghi**, M. Rastegari, A. Gupta, and A. Farhadi. **“What happens if...” Learning to Predict the Effect of Forces in Images**, in European Conference on Computer Vision (ECCV), 2016.

Y. Xiang, W. Kim, W. Chen, J. Ji, C. Choy, H. Su, **R. Mottaghi**, L. Guibas, and S. Savarese. **ObjectNet3D: A Large Scale Database for 3D Object Recognition**, in European Conference on Computer Vision (ECCV), 2016.

**R. Mottaghi**, H. Bagherinezhad, M. Rastegari, and A. Farhadi. **Newtonian Image Understanding: Unfolding the Dynamics of Objects in Static Images**, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016.

**R. Mottaghi**, H. Hajishirzi, and A. Farhadi. **A Task-oriented Approach for Cost-sensitive Recognition**, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2016.

**R. Mottaghi**, S. Fidler, A. Yuille, R. Urtasun, and D. Parikh. **Human-Machine CRFs for Identifying Bottlenecks in Scene Understanding**, in IEEE Transaction on Pattern Analysis and Machine Intelligence (TPAMI), 2016.

A. Yuille, **R. Mottaghi**. **Complexity of Representation and Inference in Compositional Models with Part Sharing**, To appear in Journal of Machine Learning Research (JMLR), Special Issue on Representation Learning, 2015.

**R. Mottaghi**, Y. Xiang, S. Savarese. **A Coarse-to-Fine Model for 3D Pose Estimation and Sub-category Recognition**, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2015.

Y. Xiang\*, C. Song\*, **R. Mottaghi**, S. Savarese. **Monocular Multiview Object Tracking with 3D Aspect Parts**, in European Conference on Computer Vision (ECCV), 2014. (\* Equal contribution)

**R. Mottaghi**, X. Chen, X. Liu, S. Fidler, R. Urtasun, A. Yuille. **The Role of Context for Object Detection and Semantic Segmentation in the Wild**, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2014.

X. Chen, **R. Mottaghi**, X. Liu, N. Cho, S. Lee, S. Fidler, R. Urtasun, A. Yuille. **Detect What You Can: Detecting and Representing Objects using Holistic Models and Body Parts**, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2014.

- Y. Xiang, **R. Mottaghi**, S. Savarese. **Beyond PASCAL: A Benchmark for 3D Object Detection in the Wild**, in IEEE Winter Conference on Applications of Computer Vision (WACV), 2014.
- A. Yuille, **R. Mottaghi**. **Complexity of Representation and Inference in Compositional Models with Part Sharing**, in International Conference on Learning Representations (ICLR), 2013.
- R. Mottaghi**, S. Fidler, J. Yao, R. Urtasun, and D. Parikh. **Analyzing Semantic Segmentation Using Human-Machine Hybrid CRFs**, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2013.
- S. Fidler, **R. Mottaghi**, A. Yuille, R. Urtasun. **Bottom-up Segmentation for Top-down Detection**, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2013.
- R. Mottaghi**. **Augmenting Deformable Part Models with Irregular-shaped Object Patches**, in IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2012.
- R. Mottaghi**, A. Ranganathan, and A. Yuille. **A Compositional Approach to Learning Part-based Models of Objects**, in International Conference on Computer Vision (ICCV), Workshop on 3D Representation and Recognition, 2011.
- J. Lee, **R. Mottaghi**, C. E. Pippin, and T. Balch. **Graph-based Planning Using Local Information for Unknown Outdoor Environments**, in International Conference on Robotics and Automation (ICRA), 2009.
- R. Mottaghi**, M. Kaess, A. Ranganathan, R. Roberts. **Place Recognition based Fixed-lag Smoothing for Environments with Unreliable GPS**, in International Conference on Robotics and Automation (ICRA), 2008.
- R. Mottaghi** and R. T. Vaughan. **An Integrated Particle Filter and Potential Field Method Applied to Cooperative Multi-Robot Target Tracking**, Autonomous Robots Journal, 23(1): 19-35, 2007.
- R. Mottaghi** and R. T. Vaughan. **An Integrated Particle Filter & Potential Field Method for Cooperative Robot Target Tracking**, in International Conference on Robotics and Automation (ICRA), 2006, Orlando, Florida.
- R. Mottaghi** and S. Payandeh. **An Overview of a Probabilistic Tracker for Multiple Cooperative Tracking Agents**, in International Conference on Advanced Robotics (ICAR), Seattle, USA, 2005.
- R. Mottaghi** and S. Payandeh. **Coordination of Multiple Agents for Probabilistic Object Tracking**, in Canadian Conference on Computer and Robot Vision, Victoria, Canada, 2005.
- M. T. Manzuri (in alphabetical order after the first author), H. R. Chitsaz, R. Ghorbani, P. Karimian, A. R. Mirazi, M. Motamed, **R. Mottaghi**, P. Sabzmejdani. **Sharif CESR Small Size Robocup Team**, A. Birk, S. Coradeschi, S. Tadokoro editors, **Robocup 2001: Robot Soccer World Cup V**. Lecture notes in Artificial Intelligence 2377, p. 595, Springer-Verlag, Berlin, 2002.

SERVICE TO THE  
ACADEMIC  
COMMUNITY

- Reviewer, EMNLP 2017, CORL 2017, ICCV 2015 and 2017, NIPS 2016-2017, ECCV 2016, CVPR 2015-2017, TPAMI, CVIU, Journal of Mathematical Imaging and Vision, IEEE Transactions on Multimedia, IPSN 2009, Mobisys 2009, Autonomous Robots.
- Program Committee Member, Workshop on 3D Representation and Recognition (3dRR), 2013 and 2015.
- Member of the organizing team of Robocup (Robot Worldcup) 2007 held in Atlanta, Georgia.

TALKS

- Carnegie Mellon University, May 2017
- MIT, May 2017
- Facebook, April 2017
- UC Berkeley, April 2017
- University of Washington, Machine Learning Lunch, February 2017
- AI2, December, 2014
- Yahoo Labs, November 2014
- eBay Research Labs, June 2014
- NEC Labs, April 2014
- University of Michigan, Ann Arbor, Systems Science Seminar, April 2013
- Carnegie Mellon University, VASC seminar, March 2013

PATENT

- A. Ranganathan and **R. Mottaghi**. **Learning part-based models of objects**, US20130279800 A1, 2013.

MEDIA

- **What Robots Can Learn from Babies**, *MIT Technology Review*, August 30, 2016.

TEACHING  
EXPERIENCE

- TA, *Introduction to Computer Science I*, UCLA, Winter 2010
- TA, *Introduction to Computer Science I*, UCLA, Fall 2009
- TA, *Computer Network Fundamentals*, UCLA, Fall 2008

- TA, *Computer Architecture*, Simon Fraser University, Fall 2005
- TA, *Assembly Language & System Programming*, Sharif University of Technology, Spring 2001
- TA, *Pascal Programming*, Sharif University of Technology, Spring 2001