Roozbeh Mottaghi

CONTACT INFORMATION	Allen Institute for AI Seattle, WA	*E-mail:* roozbehm@allenai.org *WWW:* http://roozbehm.info

EDUCATION

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

> PhD., Computer Science **Sep 2008 to Sep 2013**
> Advisor: Alan Yuille

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**

PROFESSIONAL
EXPERIENCE

FAIR at Meta AI

> *Research Scientist Manager* **Aug 2022 to now**

**Paul G. Allen School of Computer Science & Engineering
University of Washington**

> *Affiliate Associate Professor* **Sep 2019 to now**

Allen Institute for Artificial Intelligence (AI2)

> *Research Manager* **Jan 2020 to Aug 2022**
> *Senior Research Scientist* **May 2017 to Jan 2020**
> *Research Scientist* **Jan 2015 to May 2017**

Vicarious

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

Computational Vision and Geometry Lab, Stanford University

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

Toyota Technological Institute, Chicago, Illinois

> *Visiting Student* **Sep 2012 to Nov 2012**

Toyota Technological Institute, Chicago, Illinois

> *Research Intern* **Jan 2012 to Apr 2012**

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

Research Assistant **Jul 2009 to Sep 2013**

Honda Research Institute, Mountain View, California

Research Intern **Jun 2010 to Sep 2010**

Center for Embedded Networked Sensing (CENS), UCLA

Research Assistant **Jan 2009 to Jun 2009**

BORG lab, College of Computing, Georgia Institute of Technology

Research Assistant **Aug 2006 to May 2008**

Autonomy lab, School of Computing Science, Simon Fraser University

Research Assistant **Jan 2004 to Apr 2006**

Robocup lab, Sharif University of Technology

Research Assistant **Sep 2000 to Jun 2003**

PUBLICATIONS

D. Schwenk, A. Khandelwal, C. Clark, K. Marino, **R. Mottaghi**. **A-OKVQA: A Benchmark for Visual Question Answering using World Knowledge**, European Conference on Computer Vision (ECCV), 2022.

K. Ehsani, A. Farhadi, A. Kembhavi, **R. Mottaghi**. **Object Manipulation via Visual Target Localization**, European Conference on Computer Vision (ECCV), 2022.

K. Kotar and **R. Mottaghi**. **Interactron: Embodied Adaptive Object Detection**, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022.

S. Gadre, K. Ehsani, S. Song, **R. Mottaghi**. **Continuous Scene Representations for Embodied AI**, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022.

K. Dwivedi, G. Roig, A. Kembhavi, **R. Mottaghi**. **What do navigation agents learn about their environment?**, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022.

A. Khandelwal*, L. Weihs*, **R. Mottaghi**, A. Kembhavi. **Simple but Effective: CLIP Embeddings for Embodied AI**, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2022.
(* Equal contribution)

J. Wu, J. Lu, A. Sabharwal, **R. Mottaghi**. **Multi-Modal Answer Validation for Knowledge-Based VQA**, AAAI Conference on Artificial Intelligence (AAAI), 2022.
(**Oral presentation**)

G. Peng, J. Lu, H. Li, **R. Mottaghi**, A. Kembhavi. **Container: Context Aggregation Networks**, in Neural Information Processing Systems (NeurIPS), 2021.

K. Kotar, G. Ilharco, L. Schmidt, K. Ehsani, **R. Mottaghi**. **Contrasting Contrastive Self-Supervised Representation Learning Pipelines**, in International Conference on Computer Vision (ICCV), 2021.

P. Chattopadhyay, J. Hoffman, **R. Mottaghi**, A. Kembhavi. **RobustNav : Towards Benchmarking Robustness in Embodied Navigation**, in International Conference on Computer Vision (ICCV), 2021. (**Oral presentation**)

K. Singh, S. Bhambri, B. Kim, **R. Mottaghi**, J. Choi. **Factorizing Perception and Policy for Interactive Instruction Following**, in International Conference on Computer Vision (ICCV), 2021.

R. Zellers, A. Holtzman, M. Peters, **R. Mottaghi**, A. Kembhavi, A. Farhadi, Y. Choi. **PIGLeT: Language Grounding Through Neuro-Symbolic Interaction in a 3D World**, in the 59th Annual Meeting of the Association for Computational Linguistics (ACL), 2021. (**Oral presentation**)

L. Weihs, M. Deitke, A. Kembhavi, **R. Mottaghi**. **Visual Room Rearrangement**, in IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021. (**Oral presentation**)

K. Ehsani, W. Han, A. Herrasti, E. VanderBilt, E. Kolve, L. Weihs, A. Kembhavi, **R. Mottaghi**. **ManipulaTHOR: A Framework for Visual Object Manipulation**, in IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021. (**Oral presentation**)

K. Zeng, L. Weihs, A. Farhadi, **R. Mottaghi**. **Pushing it out of the Way: Interactive Visual Navigation**, in IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2021.

L. Weihs, A. Kembhavi, K. Ehsani, S. M. Pratt, W. Han, A. Herrasti, E. Kolve, D. Schwenk, **R. Mottaghi**, A. Farhadi. **Learning Generalizable Visual Representations via Interactive Gameplay**, in International Conference on Learning Representations (ICLR), 2021. (**Oral presentation**)

K. Ehsani, D. Gordon, T. H. D. Nguyen, **R. Mottaghi**, A. Farhadi. **What Can You Learn from Your Muscles? Learning Visual Representation from Human Interactions**, in International Conference on Learning Representations (ICLR), 2021.

D. Batra, A. X. Chang, S. Chernova, A. J. Davison, J. Deng, V. Koltun, S. Levine, J. Malik, I. Mordatch, **R. Mottaghi**, M. Savva, H. Su. **Rearrangement: A Challenge for Embodied AI**, arXiv, 2020.

M. Lohmann, J. Salvador, A. Kembhavi, **R. Mottaghi**. **Learning About Object by Learning to Interact with Them**, in Neural Information Processing Systems (NeurIPS), 2020.

J. S. Park, C. Bhagavatula, **R. Mottaghi**, A. Farhadi, Y. Choi. **Visual Commonsense Graphs: Reasoning about the Dynamic Context of a Still Image**, in European Conference on Computer Vision (ECCV), 2020. (**Spotlight presentation**)

M. Deitke*, W. Han*, A. Herrasti*, A. Kembhavi*, E. Kolve*, **R. Mottaghi***, J. Salvador*, D. Schwenk*, E. VanderBilt*, M. Wallingford*, L. Weihs*, M. Yatskar*, and A. Farhadi. **RoboTHOR: An Open Simulation-to-Real Embodied AI Platform**, in Conference on Computer Vision and Pattern Recognition (CVPR), 2020. (* Alphabetically listed equal contribution)

K. Zeng, **R. Mottaghi**, L. Weihs, and A. Farhadi. **Visual Reaction: Learning To Play Catch With Your Drone**, in Conference on Computer Vision and Pattern Recognition (CVPR), 2020.

M. Shridhar, J. Thomason, D. Gordon, Y. Bisk, W. Han, **R. Mottaghi**, L. Zettlemoyer, and D. Fox. **ALFRED: A Benchmark for Interpreting Grounded Instructions for Everyday Tasks**, in Conference on Computer Vision and Pattern Recognition (CVPR), 2020.

M. Wortsman, K. Ehsani, M. Rastegari, A. Farhadi, and **R. Mottaghi**. **Learning to Learn How to Learn: Self-Adaptive Visual Navigation using Meta-Learning**, in Conference on Computer Vision and Pattern Recognition (CVPR), 2019. (**Oral presentation**)

K. Marino, M. Rastegari, A. Farhadi, and **R. Mottaghi**. **OK-VQA: A Visual Question Answering Benchmark Requiring External Knowledge**, in Conference on Computer Vision and Pattern Recognition (CVPR), 2019.

W. Yang, X. Wang, A. Farhadi, A. Gupta, and **R. Mottaghi**. **Visual Semantic Navigation using Scene Priors**, in International Conference on Learning Representations (ICLR), 2019.

P. Anderson, A. Chang, D. Chaplot, A. Dosovitskiy, S. Gupta, V. Koltun, J. Kosecka, J. Malik, **R. Mottaghi**, M. Savva, and A. R. Zamir. **On Evaluation of Embodied Navigation Agents**, arXiv, 2018.

K. Ehsani, H. Bagherinezhad, J. Redmon, **R. Mottaghi**, and A. Farhadi. **Who Let The Dogs Out? Modeling Dog Behavior From Visual Data**, in Conference on Computer Vision and Pattern Recognition (CVPR), 2018.

K. Ehsani , **R. Mottaghi**, and A. Farhadi. **SeGAN: Segmenting and Generating the Invisible**, in Conference on Computer Vision and Pattern Recognition (CVPR), 2018. (**Spotlight presentation**)

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 Recog-
nition (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 Com-**
positional 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 Esti-**
mation 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 Con-**
text 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 Com-
puter Vision (WACV), 2014.

A. Yuille, **R. Mottaghi**. **Complexity of Representation and Inference in Com-**
positional 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. Sabzmeydani. **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.

PROFESSIONAL
ACTIVITIES

- Area Chair, ICLR 2023.

- Area Chair, CVPR 2020, 2021.

- Reviewer, CVPR 2015-2019,2022 (**Outstanding Reviewer Award, CVPR 2017 and 2019**), ICCV 2015-2021, ECCV 2016-2020, NeurIPS 2016-2021 (**Top Reviewer, NeurIPS 2019**), ICLR 2018-2022, EMNLP 2017, CORL 2017, ICRA 2017-2018, IEEE Transactions on Pattern Analysis and Machine Intelligence, IEEE Transactions on Multimedia, IPSN 2009, Mobisys 2009, Autonomous Robots.

- Scientific Advisory Board, Embodied AI workshop held at CVPR 2021.

- Co-organizer, Embodied Vision, Actions & Language workshop held at ECCV 2020.

- Co-organizer, Embodied AI workshop held at CVPR 2020.

- Co-organizer, Workshop on Games and Simulations for Artificial Intelligence held at AAAI 2019.

- Co-organizer, Workshop on Visual Understanding Across Modalities held at CVPR 2017.

Talks

- Stanford HAI Metaverse Workshop, Apr 2022

- China Society of Image and Graphics (CSIG), Mar 2022

- Unity AI Summit, Nov 2021

- ICCV workshop on Structural and Compositional Learning on 3D Data, Oct 2021

- CVPR workshop on Learning to Generate 3D Shapes and Scenes, Jun 2021

- CVPR workshop on 3D Scene Understanding for Vision, Graphics, and Robotics, Jun 2021

- CVPR workshop on 3D Vision and Robotics, Jun 2021

- Guest Lecturer, Stanford CS331B: Interactive Simulation for Robot Learning, May 2021

- NeurIPS workshop on Visually Grounded Interaction and Language, Dec 2018

- Google AI, Sep 2018

- Facebook, Aug 2018

- Intel Labs, Aug 2018

- 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

PhD Thesis
Committees

- Kiana Ehsani, University of Washington, 2016-2021, Co-advisor
- Kuo-hao Zeng, University of Washington, 2018-present, Co-advisor
- Daniel Gordon, University of Washington, 2020, Committee Member
- Samyak Datta, Georgia Tech, 2022-present, Committee Member
- Jialin Wu, UT Austin, 2022-present, Committee Member

INTERNS &
RESIDENTS

Residents:

- Mitchell Wortsman, 2018-2019
  Next Position: PhD Student, University of Washington

- Klemen Kotar, 2020-2022
  Next Position: PhD Student, Stanford University

- Apoorv Khandelwal, 2020-2022
  Next Position: PhD Student, Brown University

- Kunal Singh, 2021-present

Past Interns:

- Yuke Zhu, Stanford

- Daniel Gordon, University of Washington

- Kenneth Marino, CMU

- Arun Mallya, UIUC

- Fan Yang, CMU

- Prithvijit Chattopadhyay, Georgia Tech

- Vishvak Murahari, Princeton

- Qian Huang, Cornell

- Samir Gadre, Columbia University

- Kshitij Dwivedi, Goethe University

- Amanda Rose Yuile, UIUC

- Peng Gao, CUHK

- Jialin Wu, UT Austin

- Karl Schmeckpeper, University of Pennsylvania

PATENT

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

MEDIA

- **By Exploring Virtual Worlds, AI Learns in New Ways**, *Quanta Magazine*,
  Jun 24, 2022.

- **An ever-changing room of Ikea furniture could help AI navigate the
  world**, *MIT Technology Review*, Feb 12, 2020.

- **AI2 throws down the challenge for robotic scavenger hunt in virtual
  and real rooms**, *GeekWire*, Feb 11, 2020.

- **Can we build a brain?**, *PBS*, May 16, 2018.

- **Why scientists are teaching AI to think like a dog**, *NBC News*, April 26, 2018.

- **"Dog Cam" Trains Computer Vision Software for Robot Dogs** , *IEEE Spectrum*, April 18, 2018.

- **Researchers teach AI to think like dogs and find out what they know about the world**, *The Verge*, April 14, 2018.

- **Forget cloning dogs, A.I. is the real way to let your pooch live forever**, *Digital Trends*, April 13, 2018.

- **Who's a good AI? Dog-based data creates a canine machine learning system**, *TechCrunch*, April 11, 2018.

- **This AI thinks like a dog**, *MIT Technology Review*, April 11, 2018.

- **The idea of robot butlers fuels our fantasies – and our fears**, *CBC News*, March 9, 2018.

- **Virtual reality training ground helps robots prepare for the real world**, *Digital Trends*, February 19, 2018.

- **AI2-THOR Interactive Simulation Teaches AI About Real World**, *IEEE Spectrum*, February 15, 2018.

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