

# Vikas Dhiman

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## RESEARCH INTERESTS

3D Computer Vision, Robotics, Localization, Mapping, Navigation

## EDUCATION

### University of Michigan

Ph.D. in Electrical and Computer Engineering

Advisor: Jason J. Corso

Dissertation title: Towards better navigation

Ann Arbor, MI

Expected: Summer 2018

### State University of New York at Buffalo

M.S. in Computer Science and Engineering

Buffalo, NY

2012-2014

### Indian Institute of Technology Roorkee, India

B.S. in Electrical Engineering

Roorkee, India

2004-2008

## WORK EXPERIENCE

### Research Assistant

EECS, University of Michigan

Advisor: Jason J. Corso

Primary Focus: Improving algorithms for localization, mapping and navigation in mobile robots.

Ann Arbor, MI

Aug 2014-Present

### Research Intern

NEC Lab America, INC.

Mentor: Manmohan Chandraker

Project: Investigating occlusion aware models for localization

Cupertino, CA

May 2014-Aug 2014

### Research Assistant

Dept. of CSE, State University of New York at Buffalo

Advisor: Jason J. Corso

Primary Focus: Improving algorithms for localization, mapping and navigation in mobile robots.

Buffalo, NY

Jan 2012-May 2014

### Senior IT Engineer

D.E. Shaw Software India Private Ltd.

Responsibilities: Automation of data collection, scraping, parsing and visualization jobs.

Hyderabad, India

2008-2012

## PUBLICATIONS<sup>1</sup>

- C7. **V. Dhiman**, S. Banerjee, B. Griffin, Siskind J, and J. Corso. Do deep reinforcement learning algorithms really learn to navigate? In *Proceedings of International Conference on Learning Representations (Under Review)*, 2018
- C6. S. Kumar, **V. Dhiman**, P. A. Koch, and J. J. Corso. Learning compositional sparse bimodal models. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2017. (h5: 114)
- C5. **V. Dhiman**, Q. Tran, J. Corso, and M. Chandraker. A continuous occlusion model for road scene understanding. In *2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, pages 4331–4339, June 2016. (h5: 158)<sup>2</sup>
- C4. **V. Dhiman**, A. Kundu, F. Dellaert, and J. J. Corso. Modern MAP inference methods for accurate and faster occupancy grid mapping on higher order factor graphs. In *IEEE International Conference on Robotics and Automation*, 2014. (h5: 71)

<sup>1</sup>h5-Index (h5) provided by Google Scholar.

<sup>1</sup>CVPR, IROS and ICRA are premier conferences in computer vision and Robotics. For each, typical number of submissions is around 2000 and the overall acceptance rate is around 30-40%.

<sup>2</sup>CVPR is the highest rated publication venue for computer vision and eighth-highest across all engineering and computer science, according to Google Scholar metrics.

- C3. S. Kumar, **V. Dhiman**, and J. J. Corso. Learning compositional sparse models of bimodal percepts. In *Proceedings of AAAI Conference on Artificial Intelligence*, 2014. (h5: 56)
- C2. J. Ryde, **V. Dhiman**, and R. Platt. Voxel planes: Rapid visualization and meshification of point cloud ensembles. In *Proceedings of Intelligent Robots and Systems*, 2013. (h5: 50)
- C1. **V. Dhiman**, J. Ryde, and J. J. Corso. Mutual localization: Two camera relative 6-dof pose estimation from reciprocal fiducial observation. In *Proceedings of International Conference on Intelligent Robots and Systems*, 2013. (h5: 50)

#### SOFTWARE & DATA SETS

##### **Do DRL Algorithms really learn to navigate?**

[github.com/umrobotslang/does-drl-learn-to-navigate](https://github.com/umrobotslang/does-drl-learn-to-navigate)

##### **Learning compositional sparse bimodal models**

[bitbucket.org/surenkum/bimodal\\_sparse](https://bitbucket.org/surenkum/bimodal_sparse)

##### **Modern MAP inference methods for occupancy grid mapping on higher order factor graphs.**

[github.com/wecacuee/modern-occupancy-grid](https://github.com/wecacuee/modern-occupancy-grid)

##### **Voxel Planes: Rapid visualization and meshification of point cloud ensembles**

[bitbucket.org/wecacuee/voxelplanes](https://bitbucket.org/wecacuee/voxelplanes)

##### **Mutual Localization: Two camera relative 6-dof pose estimation from reciprocal fiducial observation.**

[github.com/wecacuee/mutual\\_localization](https://github.com/wecacuee/mutual_localization)

#### TEACHING

##### **Lecture on Probabilistic graphical models**

Nov, 2017

[vikasdhiman.com/eecs442/20171109.html](https://vikasdhiman.com/eecs442/20171109.html)

A lecture on the basics of probabilistic graphical models in class on introduction to computer vision. The students had limited background in machine learning and probability.

##### **Lecture on OpenGM2: Library for Probabilistic graphical models**

Jan 2015

[github.com/wecacuee/opengmdemo](https://github.com/wecacuee/opengmdemo)

A lecture on the usage of the library OpenGM2 with an in class demo of OpenGM2 library applied to a simple problem. This gave the students a quick start on their course projects.

##### **Xplore Engineering: Computer Vision and Pinhole cameras**

Jun 2015, 2016

[vikasdhiman.com/xplore-workshop/pinhole.pdf](https://vikasdhiman.com/xplore-workshop/pinhole.pdf)

Organized a workshop for middle school students to create interest in sciences and the field of computer vision and explain modern cameras through pinhole cameras.

#### SERVICE AS REVIEWER

- \* International Conference on Robotics and Automation 2014, 2016-18
- \* IEEE/RSJ International Conference on Intelligent Robots and Systems 2013,2016
- \* IEEE Conference on Computer Vision and Pattern Recognition 2014,2016
- \* Indian Conference on Computer Vision, Graphics and Image Processing 2014,2016
- \* Association for the Advancement of Artificial Intelligence 2015
- \* International Journal of Computer Vision 2014
- \* International Journal of Robotics Research 2016

#### REFERENCE LIST

##### **Jason J. Corso**

[jjcorso@umich.edu](mailto:jjcorso@umich.edu)

(Ph.D. Advisor), Associate Professor, EECS, University of Michigan, Ann Arbor, MI.

##### **Jeffrey M. Siskind**

[qobi@purdue.edu](mailto:qobi@purdue.edu)

Associate Professor, ECE, Purdue University, West Lafayette, IN.

##### **Manmohan Chandraker**

[mkchandraker@eng.ucsd.edu](mailto:mkchandraker@eng.ucsd.edu)

Assistant Professor, CSE, University of California, San Diego, CA.