Vikas Dhiman

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Research Interests

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

Education

University of Michigan Ann Arbor, MI
Ph.D. in Electrical and Computer Engineering *Expected*: Summer 2018
Advisor: Jason J. Corso
Dissertation title: Towards better navigation

State University of New York at Buffalo Buffalo, NY
M.S. in Computer Science and Engineering 2012-2014

Indian Institute of Technology Roorkee, India Roorkee, India
B.S. in Electrical Engineering 2004-2008

Work experience

Research Assistant Ann Arbor, MI
EECS, University of Michigan Aug 2014-Present
Advisor: Jason J. Corso
Primary Focus: Improving algorithms for localization, mapping and navigation in mobile robots.

Research Intern Cupertino, CA
NEC Lab America, INC. May 2014-Aug 2014
Mentor: Manmohan Chandraker
Project: Investigating occlusion aware models for localization

Research Assistant Buffalo, NY
Dept. of CSE, State University of New York at Buffalo Jan 2012-May 2014
Advisor: Jason J. Corso
Primary Focus: Improving algorithms for localization, mapping and navigation in mobile robots.

Senior IT Engineer Hyderabad, India
D.E. Shaw Software India Private Ltd. 2008-2012
Responsibilities: Automation of data collection, scraping, parsing and visualization jobs.

Publications [1]

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*)[2]

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*)

[1] h5-Index (h5) provided by Google Scholar.

[1] 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%.

[2] 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`

Learning compositional sparse bimodal models
`bitbucket.org/surenkum/bimodal_sparse`

Modern MAP inference methods for occupancy grid mapping on higher order factor graphs.
`github.com/wecacuee/modern-occupancy-grid`

Voxel Planes: Rapid visualization and meshification of point cloud ensembles
`bitbucket.org/wecacuee/voxelplanes`

Mutual Localization: Two camera relative 6-dof pose estimation from reciprocal fiducial observation.
`github.com/wecacuee/mutual_localization`

Teaching

Lecture on Probabilistic graphical models Nov, 2017
`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`
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`
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`
(Ph.D. Advisor), Associate Professor, EECS, University of Michigan, Ann Arbor, MI.

Jeffrey M. Siskind `qobi@purdue.edu`
Associate Professor, ECE, Purdue University, West Lafayette, IN.

Manmohan Chandrakar `mkchandraker@eng.ucsd.edu`
Assistant Professor, CSE, University of California, San Diego, CA.