Vikas Dhiman

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RESEARCH INTEREST

Semantic mapping, Tracking and Mapping, SLAM, Augmented Reality, Computer Vision

EDUCATION

PhD student in Computer Science (ongoing) 2012-present
State University of New York at Buffalo, USA *GPA: 3.778/4*

Bachelors in Electrical Engineering 2004-2008
Indian Institute of Technology Roorkee, India *CGPA: 8.210/10*

WORK EXPERIENCE

Research Assistant - Advanced Emergency Response Jan 2012 - present
SUNY Buffalo

Used cooperative localization and mapping along with augmented reality using RGBD sensors to help emergency responders better understand and prioritise various emergencies.

Senior Member-Information Technology June 2008 - Dec 2011
D.E. Shaw India Software Pvt. Ltd.

Worked on automatic retrieval, extraction and persistence of data from website, emails and feeds.

PROJECTS

Voxel Planes Feb 2013 - present
with Dr. Julian Ryde *SUNY Buffalo*

Contributed to a mapping, localization and surface reconstruction algorithm based on fitting planar surfaces to voxels. Worked on the visualization module using VTK, add Plane-to-point ICP for mapping, added ROS wrapper and conducted the comparative experiments of the paper[2].

RGBD based Augmented Reality March 2012
with Dr. Julian Ryde, Dr. Jason Corso *SUNY Buffalo*

Developed a prototype to augment observed scene with virtual objects using a Head Mounted Display with RGBD camera based camera tracking. Used PCL Kinect Fusion to localize the camera and VTK to visualize the 3D markers to be rendered.

COURSES

Pattern Recognition *Topics:* Perceptrons, SVM, Clustering, Boosting, HMM.
Project: Hand written digit recognition on MNIST dataset.

Robotic Algorithms *Topics:* Reinforcement Learning, LQR, Kalman and Particle filters, PRMs, RRTs.
Project: R1-PCA (Rotation invariant L1-PCA) vs L2-PCA on application to Voxel Planes[2].

Bayesian Vision *Topics:* MRF and Gibbs distribution, Graph cuts, LBP, Dual decompostion.
Project: Colored barcode segmentation using MRF based parametric model fitting.

Computational Vision *Topics:* Steropsis, Structure from Motion and Shading, Visual Servoing, Mapping.
Project: RGBD based Structure from Motion for long range mapping.

PUBLICATIONS

[1] V. Dhiman, J. Ryde, and J. J. Corso. Mutual localization: Two camera relative 6-DOF pose estimation from reciprocal fiducial observation. In *IROS*, November 2013.

[2] J. Ryde, V. Dhiman, and R. Platt. Voxel planes: Rapid visualization and meshification of point cloud ensembles. In *IROS*, November 2013.

COMPUTER SKILLS

Languages C++, Python, Matlab, Perl, Java

APIs ROS, OpenCV, VTK, PCL, numpy