

Samarth Manoj Brahmhatt

E-mail: samarth.robogatech.edu

Webpage: www.cc.gatech.edu/~sbrahmhb

GitHub: <https://github.com/samarth-robogatech>

LinkedIn: <https://www.linkedin.com/in/samarth-manoj-brahmhatt-a145515b>

EDUCATION

Doctor of Philosophy, Robotics

School of Interactive Computing, Georgia Institute of Technology, GA

expected May 2019

Master of Science in Engineering, Robotics

University of Pennsylvania, PA.

May 2014

Bachelor of Technology, Electronics & Communication Engineering

Nirma University, Ahmedabad, India.

May 2012

PUBLICATIONS

1. “[MapNet: Geometry-Aware Learning of Maps for Camera Localization](#)” - **Samarth Brahmhatt**, Jinwei Gu, Kihwan Kim, James Hays, Jan Kautz, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2018*
2. “[DeepNav: Learning to Navigate Large Cities](#)” - **Samarth Brahmhatt**, James Hays, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2017*
3. “[StuffNet: Using ‘Stuff’ to Improve Object Detection](#)” - **Samarth Brahmhatt**, Henrik Christensen and James Hays, *IEEE Winter Conference on Applications of Computer Vision (WACV) 2017*
4. “[Occlusion-Aware Object Localization, Segmentation and Pose Estimation](#)” - **Samarth Brahmhatt**, Heni Ben Amor and Henrik Christensen, *British Machine Vision Conference (BMVC) 2015*
5. “[Single Image 3D Object Detection and Pose Estimation for Grasping](#)” - Menglong Zhu, Kosta Derpanis, Yinfei Yang, **Samarth Brahmhatt**, Mabel Zhang, Cody Phillips and Kostas Daniilidis, *IEEE International Conference on Robotics and Automation (ICRA) 2014*
6. “[RoboCup 2013 Humanoid Kidsize League Winner](#)” - Daniel D. Lee, Seung-Joon Yi, Stephen McGill, Yida Zhang, Larry Vadakedathu, **Samarth Brahmhatt**, Richa Agrawal and Vibhavari Dasagi, *RoboCup 2013: Robot World Cup XVII, Springer Berlin Heidelberg 2014*
7. “[Practical OpenCV](#)” - **Samarth Brahmhatt**, book published by Apress Media LLC

RESEARCH EXPERIENCE

[Institute for Robotics and Intelligent Machines, Georgia Tech](#)

Fall 2014 - present

Graduate Research Assistant

- Learning to navigate large cities using Convolutional Neural Networks (CNNs) (Pub. 2)
- Object detection and semantic segmentation using CNNs (Pub. 3)
- Detection and 3D pose estimation of partially occluded objects (Pub. 4)

[NVIDIA Research](#)

Summer 2017

Deep Learning and Simultaneous Localization and Mapping (SLAM) research

- Deep learning for image-based relocalization: proposed novel algorithms to use geometric constraints between images and to make use of large amounts of unlabelled data through semi-supervised learning (Pub. 1)

[Dextro, Inc. New York City](#)

Summer 2015

Improving CNN-based object localization using local context

- Implemented a Convolutional Neural Network system for object localization and semantic segmentation (Pub. 3)

- Used semantic segmentation as a local context signal to improve object detection
- Implemented CPU and GPU versions of various required layers in Caffe

GRASP Laboratory, University of Pennsylvania

Spring 2014

Detecting Partially Occluded Objects in Images (Masters' Thesis)

- Augmented the DPM object detection algorithm to detect up to 60% occluded objects
- Used HOG features and graph-cuts to segment all pixels inside the bounding box to object/non-object
- Used Structural SVM to train HOG feature and graph edge weights (Pub. 4)

GRASP Laboratory, University of Pennsylvania

Fall 2013

Active Deformable Part models inference implementation

Wrote MEX implementation of the A-DPM object-detection algorithm inference part. This algorithm treats part inference order in DPM as a scheduling problem and achieves up to 3x speedup over Cascade-DPM.

GRASP Laboratory, University of Pennsylvania

Summer 2013

Detection and 6-DOF pose estimation of objects from a single 2D image

Helped develop an algorithm to detect objects using their shape and estimate their 6-DOF pose from a single RGB image by matching the outline with a CAD model (Pub. 5). Works in heavily cluttered scenes.

GRASP Laboratory, University of Pennsylvania

Spring 2013

Robocup 2013 Humanoid Kid-size soccer international competition

Our team won the Kid-size competition after competing against international teams. I contributed to the particle-filter based localization system and player location disambiguation based on the goalkeeper ball estimate.

COURSEWORK

Learning in Robotics (ESE 650)

Spring 2013

- RGB-D point-cloud registration for 3D mapping ([wiki](#))
- Planar Simultaneous Localization and Mapping using a particle filter ([wiki](#))
- Image panoramas using 3-DOF orientation tracking by an Unscented Kalman Filter ([wiki](#))
- Path planning in aerial photographs using imitation learning ([wiki](#))
- Probabilistic color image segmentation using Gaussian Mixture Models ([wiki](#))

Computer Vision and Computational Photography (CIS 581)

Fall 2013

- Logo replacement using Shape Context feature matching ([wiki](#))
- Panoramas by Corner appearance feature matching ([wiki](#))
- Image Morphing by Thin Plate Splines ([wiki](#))

Machine Perception (CIS 580)

Spring 2013

- Image stitching using vanishing points and matching points ([wiki](#))
- Logo warping using perspective transforms ([wiki](#))

Intro to Parallel Programming (Udacity Online Course)

Summer 2014

- Tone mapping using histogram equalization
- Poisson blending of masked images

COMPUTER SKILLS

- *Programming Languages:* C++, Python, Matlab
- *Libraries and Tools:* OpenCV, CUDA, Caffe, PyTorch, Vim, Git, L^AT_EX

References available upon request.