Rohan Banerjee

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Phone: (703)-743-4178 E-Mail: rohanb@mit.edu

EDUCATION

Massachusetts Institute of Technology (MIT)   **Cambridge, MA**
M.Eng. in Electrical Engineering and Computer Science, GPA: 4.5/5.0   June 2019
S.B. in Electrical Engineering and Computer Science, GPA: 4.9/5.0   June 2018

Relevant Coursework: Statistical Learning Theory and Applications, Robotics: Science and Systems, Bayesian Modeling and Inference, Machine Learning, Inference and Information, Design and Analysis of Algorithms, Computational Cognitive Science, Discrete-Time Signal Processing, Elements of Software Construction, Computation Structures

Thomas Jefferson High School for Science and Technology   **Alexandria, VA**
SAT: 2400, GPA (weighted): 4.538/4.0   September 2010 – June 2014

Relevant Coursework: Artificial Intelligence, Parallel Computing

RESEARCH EXPERIENCE

Massachusetts Institute of Technology   **Cambridge, MA**
Research Engineer   June 2019 – April 2020 (expected)
- Conducting research as a member of the DRL (Distributed Robotics Laboratory) group at CSAIL (Computer Science and Artificial Intelligence Laboratory)
- Refining autonomous driving simulation platform based on CARLA open-source driving simulator
- Validating research algorithms in simulation for vehicle navigation, dynamic obstacle avoidance, and end-to-end learning
- Supporting research in language understanding and human-robot interaction involving the Toyota Human Support Robot platform

Massachusetts Institute of Technology   **Cambridge, MA**
M.Eng. Researcher   March 2018 – June 2019
- Principal Investigator: Prof. Daniela Rus
- Conducted research as a member of the DRL (Distributed Robotics Laboratory) group at CSAIL (Computer Science and Artificial Intelligence Laboratory)
- Thesis Title: "Development of a Simulation-Based Platform for Autonomous Vehicle Algorithm Validation"
- Developed autonomous vehicle simulation platform based on CARLA open-source driving simulator
- Investigated learning algorithms for LIDAR-based rural road detection

Massachusetts Institute of Technology   **Cambridge, MA**
UROP (Undergraduate Research Opportunities Program)   November – December 2017
- Principal Investigator: Prof. Jonathan How
- Conducted research as a member of the ACL (Aerospace Controls Laboratory) group
- Contributed to the development of a tripod-based sensor platform for pedestrian localization and intention recognition
- Calibrated webcams and LIDAR (Velodyne VLP-16), and investigated power management options for tripod platform

Massachusetts Institute of Technology   **Cambridge, MA**
SuperUROP Advanced Undergraduate Research Program   September 2016 – May 2017
- Principal Investigator: Dr. Jim Glass
- Conducted research as member of the SLS (Spoken Language Systems) group at CSAIL (Computer Science and Artificial Intelligence Laboratory)
- Contributed to the development of a conversational robotic system that can acknowledge speaking subjects
- Converted offline Voice Activity Detector module into real-time streaming module
- Researched techniques for integrating visual face detection and audio source localization

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George Mason University   **Fairfax, VA**
Applied Mathematics Intern, Aspiring Scientists Summer Internship Program   June – August 2012, June – August 2013
- Principal Investigator: Prof. Padmanabhan Seshaiyer
- Developed MATLAB simulation of 1D Euler-Bernoulli Beam PDE system (2012); Modeled deformation of 2D membrane PDE system in COMSOL (2013)
- Simulated lung tissue fluid-structure interaction in MATLAB and developed lung tissue edge detection Python program: Pneumothorax Modeling and Diagnosis (2012)

INDUSTRY EXPERIENCE

Autoliv (now Veoneer)   **Lowell, MA**
Intern, Advanced Sensing Group   June – August 2017
- Developed mapping algorithm for LIDAR data (Velodyne HDL-64) using point cloud registration to maintain coherent point cloud history and advance lane/object tracking algorithms
- Investigated mapping/registration techniques with lower-resolution (Velodyne VLP-32) LIDAR data to improve point cloud data resolution
- Investigated ego-motion estimation techniques with VLP-64 data to support vehicle localization

Northrop Grumman   **San Diego, CA**
Intern, Systems Integration, Test & Evaluation   June – August 2016
- Supported Systems Integration, Test & Evaluation for the Triton UAV (Unmanned Aerial Vehicle) program
- Developed Python test automation script for Triton test-bench landing test
- Co-developed SQL database for automated processing of Triton System Test Requests
- Improved upon Excel database for tracking flight requirements and test points
- Researched test automation methods for future modular hot-bench

NASA Goddard Space Flight Center   **Greenbelt, MD**
Intern, Mission Engineering and Systems Analysis Division   January 2015; June – August 2015; January 2016
- Contributed to the NICER (Neutron Star Interior Composition Explorer)/SEXTANT (Station Explorer for X-Ray Timing and Navigation) mission
- Updated 1PPS signal interrupt handler Linux kernel module for hardware timing and synchronization
- Co-developed simulator of bi-directional science and telemetry packet transmission with another intern

HONORS AND AWARDS

Intel International Science and Engineering Fair   **Phoenix, AZ**
Fourth Place in Category: Mathematical Sciences   May 2013

Siemens Competition in Math, Science, and Technology   **Atlanta, GA**
Selected for Regional Finals at Georgia Tech for biophysics project   November 2012

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PUBLICATIONS

[1] A.R. Bhandarkar, **R. Banerjee** & P. Seshaiyer, "On the Stability of Lung Parenchymal Lesions with Applications to Early Pneumothorax Diagnosis," *Computational and Mathematical Methods in Medicine*, vol. 2013, pp. 1-12, 2013.

[2] **R. Banerjee** & P. Seshaiyer. "Computational Mechanics of a Coupled Flow-Structure Interaction Problem with Applications to Bio-Inspired Micro Air Vehicles," *International Journal of Aerospace and Lightweight Structures (IJALS)*, vol. 3, no. 3, pp. 399-407, 2013.

TEACHING EXPERIENCE

Massachusetts Institute of Technology   **Cambridge, MA**
Teaching Assistant, Introduction to Probability (6.041/6.431)   September – December 2018, February – May 2018
- Taught weekly tutorial problem-solving sessions to small student groups
- Conducted office hours to assist students with concepts and problem sets

Massachusetts Institute of Technology   **Cambridge, MA**
Lab Assistant, Introduction to Electrical Engineering and Computer Science I (6.01)   February – May 2015
- Assisted students with in-class Software Labs and engineering Design Labs

PROJECTS

3D Point Cloud Clustering Using Small-Variance Asymptotics   **Cambridge, MA**
Class Project, Bayesian Modeling and Inference (6.882)   March 2018 – May 2018
- Explored Bayesian non-parametric clustering of 3D point cloud data using small-variance asymptotics approximate inference algorithms
- Implemented Kulis and Jordan (2012) small-variance asymptotics algorithm for DP-GMM and Straub et al. (2015) algorithm for DP-vMF-MM in Python

MIT Unmanned Aerial Vehicle Team   **Cambridge, MA**
Student Participant   September 2014 – September 2017
- Developed refined 2D simulator of competition arena and agent dynamics for the International Aerial Robotics Competition as simulation team lead
- Managed development of computer vision gridline and circle detection Python programs as computer vision team lead
- Co-developed Python simulator of competition arena and contributed to UAV path planning algorithms as member of artificial intelligence team