

Shehzaman Salim Khatib

shehzi.1@gmail.com • <https://shehzaman.github.io>

EDUCATION

- **Robotics Institute, Carnegie Mellon University**
Masters in Robotics; GPA: 3.71
Pittsburgh, PA
Aug 2014 - August 2016
- **Indian Institute of Technology Madras**
Bachelor of Technology in Mechanical Engineering
Master of Technology in Energy Technology; Cumulative GPA: 9.23/10
Chennai, India
Aug 2009 - May 2014

SKILLS

- Path planning, Localization, Machine Learning, Computer Vision
- Programming: Python, C++, MATLAB, ROS, Gazebo, 3D modelling (Inventor, SolidWorks)
- Embedded Systems: AVR family (AtMega16, AtMega128), Arduino, Beagle Bone Black

EXPERIENCE

- **Path planning in a Distance-Constrained Hazardous Environment**
Course project - Math Fundamentals for Robotics (16-811) *August-December, 2014*
 - Developed a method to optimize paths of multiple robots that are required to rendezvous after travelling a specified distance.
 - Applied algorithm on a resource-constrained planning problem for multiple robots that meet to share resources (such as energy).
- **Forecast use of a city bikeshare system**
Course project - Graduate Artificial Intelligence (15-780) *January-May, 2015*
 - Predicting city (Washington DC) bike-sharing demand given physical data such as time of day, temperature, and humidity.
 - Compared the prediction capability of three different learning techniques: k-Nearest Neighbors (kNN), Decision Trees (DT), and Neural Networks (NN).
 - Provided a theoretical analysis on error bounds and parameter optimization using VC-dimension and Cross Validation (CV).
- **Learning and Recognising Air Marshalling signals**
Course project - Computer Vision (16-720) *August-December, 2014*
 - Applied deformable parts model (DPM) to recognise human pose from images found on the internet.
 - Learned air marshalling signals using geometric information from human pose and predicted signals on real time data from a kinect.
- **MITACS Globalink Scholar, 2013 at University of British Columbia, Kelowna**
Visiting Undergraduate Research Assistant at the ACIS lab working under the guidance of [Professor Homayoun Najjaran](#). *May-July, 2013*
 - Project 1: Ported a dynamic robot simulator for evaluating planning algorithms, from C++/ROS and Gazebo-3D simulator for use with MATLAB.
 - Project 2: Developed a low cost (~\$10) high voltage DC-DC and DC-AC converter for Digital Microfluidic Systems (also known as Lab on Chip devices).

PUBLICATIONS

- Luo W., **Shehzaman, S.K.**, Nagavalli S., Chakraborty N., Sycara K., “Asynchronous Distributed Information Leader Selection in Robotic Swarms.”
IEEE International Conference on Automation Science and Engineering (CASE 2015)
This paper presents asynchronous distributed algorithms for information leader selection in multi-robot systems. The leader selection problem is formulated as finding a core set that can be used to compute the Minimum-Volume Enclosing Ellipsoid (MVEE) representing the swarm boundary. Our algorithms extract a leader core set in a fully distributed manner and implicitly select core set members as information leaders. Results for simulated swarms of 50 robots and experiments with a swarm of 10 TurtleBots are provided to evaluate the effectiveness of the proposed algorithms.
- Farrokhsiar, M., **Shehzaman, S.K.**, Najjaran, H, “Robust Active SLAM: A Tube-based Approach.”
Journal of Intelligent and Robotic Systems
This paper analyses the robustness of the conventional active SLAM methods and propose integration of the set-theoretic and information theoretic frameworks to increase the robustness of the information theoretic active SLAM methods. Matlab simulations and ROS/Gazebo experiments indicate the effectiveness of the proposed method. *Submitted - August, 2014*

SCHOLASTIC AWARDS

- Fellowship, Kishore Vaigyanik Protsahan Yojana (KVPY) 2008, awarded by Indian Institute of Science (IISc), Bangalore - 140 students were awarded this fellowship from all over India.
- Fellowship, National Talent Search Examination (NTSE) 2006, awarded by NCERT board, India.
- Among the top 300 students in India selected for Indian National Chemistry Olympiad (INChO) and Indian National Astronomy Olympiad (INAO), 2009.