

Aravindh Mahendran

Graduate Student, Robotics Institute, School of Computer Science, Carnegie Mellon University

Email id: amahend1@andrew.cmu.edu

Phone No: +1 (410) 340-8024

Education

Examination	School/College	Year	CPI/%
MS in Robotics	Carnegie Mellon University	2012-Current	4.07/4.33
B. Tech (Honors) in Computer Science & Engineering	IIIT Hyderabad	2008-12	9.81/10
AISSE (Intermediate+2)	Apeejay School, Nerul (CBSE)	2008	87.80%
AISSCE (Matriculation)	Apeejay School, Nerul (CBSE)	2006	90.20%

Standardized Tests

<u>GRE – General Test (159/170)</u>	<u>TOEFL (115/120)</u>	
Verbal Reasoning (159/170, 84 percentile)	Reading: 30/30	Speaking: 27/30
Quantitative Reasoning (170/170, 99 percentile)	Listening: 29/30	Writing: 29/30
Analytical Writing (4.5/6, 72 percentile)		

Publications

“Detecting Buses for Real Time Traffic Control”; Aravindh Mahendran, Stephen Smith, Martial Hebert; *Submitted to the IEEE Winter Conference on Applications of Computer Vision (WACV 2014)*.

“Heterogeneous UGV-MAV Exploration Using Integer Programming”; Ayush Dewan, Aravindh Mahendran, Nikhil Soni and K. Madhava Krishna; *International Conference on Intelligent Robots and System (IROS 2013)*.

“Optimization Based Coordinated UGV-MAV Exploration for 2D Augmented Mapping”; Ayush Dewan, Aravindh Mahendran, Nikhil Soni, K Madhava Krishna; Extended abstract at *Autonomous Agents and Multiagent Systems (AAMAS 2013)*.

“UGV-MAV Collaboration for Augmented 2D Maps”; Aravindh Mahendran, Ayush Dewan, Nikhil Soni, K. Madhava Krishna; *International Conference of Robotics Society of India (ICRSI 2013)*.

Areas of Interest

Machine learning, Computer Vision, Optimization, Cognitive Science, Robotics

Work Experience

- Research Assistant – Intelligent Control & Logistics Laboratory, Robotics Institute, CMU. (Jan’13 – Current).
 - Worked on bus detection in noisy traffic video under the guidance of Prof. Stephen Smith and Prof. Martial Hebert.
 - Experimented with modifications to the Exemplar SVM algorithm by incorporating domain constraints to improve detection speed and accuracy.
- Summer internship at Robotics and Embedded Systems Lab and Interaction lab, Viterbi School of Engineering, Univ. of Southern California as part of Viterbi India program (May – July 2011)
 - Worked on registration of point clouds obtained from different Microsoft Kinects, under the guidance of Prof. Gaurav Sukhatme and Prof. Maja Matarić.
 - Experimented with calibration target and feature matching based approaches.
 - Proposed a novel plane matching approach that utilized an error metric based on both depth and color information of the point cloud.

Scholastic Achievements

- Joint Institute **Gold Medalist** for the batch of 2008. Awarded **Dean’s List I** for Excellence in Academics

for semesters Fall'08,'09,'10,'11 Spring'09,'10,'12 and Dean's List **II** for Spring'11.

- One among **35** students selected from across the nation (India) to attend the **International Mathematics Olympiad Training Camp (IMOTC)** for two consecutive years, 2007 and 2008
- Secured All India Rank **162** in All India Engineering Entrance Examination-2008 (among 793,000 candidates).
- Secured All India Rank **2552** in IIT Joint Entrance Examination-2008 (among 312,000 candidates).

Research and Projects

Bus Detection in Traffic Video

December 2013-Current

Dr. Stephen Smith (ICLL, CMU), Dr. Martial Hebert (VASC group, CMU)

Experimented with several modifications to the Exemplar SVM algorithm for bus detection in traffic video data. High sensor noise and wide variations in illumination due to adverse weather conditions demand good exemplar SVM calibration. Search space pruning using domain knowledge leads to significant improvements in detection speed and accuracy.

Collaborative UGV, UAV exploration

September – October, 2011

Dr. Madhava Krishna (Robotics Research Center, IIIT Hyderabad)

Developed an integer program to decide the next best position for a team of UGVs and UAVs for optimal exploration. Each robot-frontier pair is a binary variable and complex constraints such as minimum distance between frontiers and visibility of UAV from UGV are modeled to incorporate real world limitations of these robots.

Honors project - Peripheral Vision, Motion and color perception

July 2010 – Jan. 2011

Dr. Bipin Indurkha, Mrs. Kavita Vemuri (Cognitive Science Lab, IIIT Hyderabad)

Conducted an experiment concerning peripheral vision and color perception. Colored moving objects were shown in the periphery and the observer's reaction time was measured. Preliminary data suggests that reaction time is effected by color of object in periphery but not the color of fixate and also depends on direction of motion of foveal stimuli. This work resulted in a term paper.

Other Projects

- Implemented path planning using RRT, particle filter based Monte-Carlo localization and occupancy grid mapping on Amigo bot.
- Implemented sift feature based image search using term-document matrix. Query expansion and term frequency - inverse document frequency (tfidf) methods for improving performance.
- Developed an educational game based on the popular Snake game under the guidance of Dr. Matthew Kam and his team for the MILLEE project (Mobile and Immersive Learning for Literacy in Emerging Economies).

Select courses

Machine learning, Statistical Machine Learning, Learning Based Methods in Computer Vision, Computer vision, Statistical Methods in Artificial Intelligence, Optimization Methods, Linear algebra, Introduction to cognitive science, Convex Optimization (Audit)

Computer Proficiency

Operating Systems	GNU/Linux , Windows
Languages	C , C++, Matlab
Robotics/CV Software	ROS, Point Cloud Library, OpenCV

Extra-curricular Activities/ Achievements

Western Classical Music using Electronic Keyboard

- Secured distinction in Grade 5 practical examination under **Trinity College of Music, London**.
- Ranked **3rd** in Bombay region in the same.