Lekha Walajapet Mohan

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EDUCATION

August 2015 - December 2016   **Carnegie Mellon University, Pittsburgh, USA**
M.S. Robotic Systems Development, Robotics Institute, School of Computer Science
Cumulative GPA(on a scale of 4) : 3.32

July 2010 - May 2014   **Anna University, Sri Sairam Institute of Technology, India**
B.E in Electric and Electronics Engineering (*with honors*)
Cumulative Performance Index (on a scale of 10) : 8.16

RESEARCH EXPERIENCE AND PROJECTS

- **Learning from Human Demonstrations on Baxter Platform**, Research Assistant(Extern)   *(Feb'17 - Present)*
  Advisor: Prof. Abhinav Gupta, Carnegie Mellon University, Pittsburgh, USA

    * Investigating **Learning from Human Demonstrations**
    * Developing a novel **large-scale dataset** of human-robot demonstrations for complex manipulation using Baxter robot
    * Research goal is to learn invariant task descriptors for a bi-manipulator robot to imitate a novel demo video
    * Currently working on formulating spatio-temporal frameworks using memory networks for learning generalized manipulation actions
    * Dataset **will be publicly available** for other researchers

- **Collision Avoidance for Industrial Robots**, Robotics Intern   *(May'16 - Aug'16)*
  Supervisor: Jonathan Whetten, Director of Software Engineering, 5D Robotics

    * Predicted future path of the robot for **collision avoidance** using custom sensors for industrial robots
    * Integrated the above into an Rviz plugin - Deployed as a product at 5D Robotics's customer base
    * Worked on **perception for slot-detection** on autonomous forklifts using LiDAR data

- **Human Assistive Robotic Picker UR5 platform, *Amazon Picking Challenge* **, MRSD   *(Aug'15 - Mar'16)*
  Advisor: Prof. Maxim Likhachev, Carnegie Mellon University

    * Developed perception and grasping sub-system using UR5 industrial robot for warehouse automation
    * Automated collection of grasping dataset to **estimate optimal grasping surface(improved accuracy by 8%)**
    * Developed perception for identification and semantic segmentation of images(as a team of 2)
    * Represented CMU in **Amazon Picking Challenge16** Robocup, Leipzig, Germany
    * Explored systems engineering, developing and managing complex systems

- **Task and Motion Planning for Complex Manipulation on HERB platform, CMU**   *(Jan'16 - Mar'16)*
  Collaborator: Dr. Jennifer King, Carnegie Mellon University

    * Implemented **integration of high-level task planner with low-level motion planners** on the HERB platform
    * Task planner sorts out subgoals, motion planners generates arm motions for HERB to clear the table

- **Bootstrap Resampling for Image Registration without Ground Truth** , Project Associate   *(Oct'14 - Dec'14)*
  Advisor: Prof. Ganapathi Krishnamurthi, Indian Institute of Technology- Madras

    * Worked on estimating uncertainty for Image registration algorithms when the ground data is unavailable.
    * Implemented bootstrap resampling for pixel based minimization criteria for image registration

- **Estimation of Orientation and Position of Madras Parallel Manipulator**, Project Associate   *(Jun'14 - Sep'14)*
  Advisor: Prof. Sandipan Bandyopadhyay, Indian Institute of Technology- Madras

    * Built a customized stereo vision system for a novel 3 DoF parallel manipulator
    * Implemented real-time pose detection of moving manipulator to control its orientation for rehabilitation purposes

- **Real time Gesture Controlled Robot using Wearable Computing**, Undergraduate researcher *(Jun'14 - Sep'14)*
  Advisor: Prof. S.Bhavani, Sri Sairam Institute of Technology, Anna University

  - ⋆ Designed a controller using 3-axis accelerometer (ADLX 330) for industrial robot - implemented gesture control using data interface hand gloves
  - ⋆ Deployed flex sensors that controlled the angle of the mini servo connected to the robot.
  - ⋆ Motions performed were pick, drop,forward, reverse, left and right. Built as a prototype for use in disaster affected zones.

PUBLICATIONS

Conference Publications:

- Samerender N.H, W.M.Lekha, H. Ramyya. **Pupillometry in Conjugation with Automatic Parking as a Tool of Automobile Safety**. *Proceedigns of 2014 International Conference on Signal Processing and Integrated Networks (SPIN).* 2014

Journal Publications:

- Samerender N.H, H. Ramyya, W.M.Lekha. **Secure Methodology for Data Encryption with DNA Steganography and vein Patterns**. *International Journal of Information and Computation Technology.* 2013

AWARDS AND SCHOLARSHIPS

- Awarded the **Best Student of the Year 2014**, by the undergraduate school
- Ranked **6th** in inter-collegiate(out of 150 students) in *8th National Cyber Olympiad*
- Awarded the **Best Cadet Award** - National Cadet Corps India, a 2 year military focused search-and-rescue training camp (out of 180 cadets).
- Ranked **3** in **Best Innovative Projects of the Year** (400 students) for my work on **Real-Time Gesture Recognition Controlled robot using wearable computing**, instituted by Department of Electrical and Electronics

SERVICE

- **Executive Member**, Indian Graduate Student Association, Carnegie Mellon University *(Dec '15 - Present)*
- **Secretary of Department of Electrical and Electronics Engineering**, SIT *(Apr '12 - Apr '13)*
- **Tutor for the visually challenged**, NGO Bhumi, India *(Jul '12 - Mar '14)*

RESEARCH INTERESTS

Artificial Intelligence and Robotics : Manipulation, Multi-modal perception, Human-Centered Robotics
Statistics and Machine Learning : Robot Learning

REFERENCES

Prof.Abhinav Gupta	Dr.John Dolan	Prof. Maxim Likhachev
Associate Professor	Director of MRSD program	Research Associate Professor
Robotics Institute	Robotics Institute	Robotics Institute
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