Phani Teja Singamaneni

Contact Information

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Research Interests

Reinforcement Learning, Motion planning, Multi-task Learning, Dynamics and Control, Humanoid robots, Modular robots, Manipulators.

Education

July 2012 - 2016 B.Tech (*Honours*) in Electronics and Communication Engineering
International Institute of Information Technology, Hyderabad, India
Gpa: 8.87/10

July 2016 - 2018 Master of Science in Electronics and Communication Engineering by Research
International Institute of Information Technology, Hyderabad, India
Dissertation topic: "*Learning Multi-Goal Reachability in a Humanoid Robot using Deep Reinforcement Learning*"
Advisors: K. Madhava Krishna, Abhishek Sarkar
Gpa: 10/10

Gold Medallist for the Dual Degree Class of 2012 with overall Gpa of 8.97

Achievements and Awards

2013-2016: Academic Awards during five semesters (Dean's list - I, II, I, I, I).
Spring, 2015: Research Award: Awarded for publishing competitive research at Undergraduate level.
2014: Winner of Electronics Hackathon held at IIIT-Hyderabad.

Experience

Aug 2015 - 2018 | Research Assistant at Robotics Research Center, IIIT-Hyderabad
Designing a novel reinforcement learning frame work for complex tasks in Humanoid robot. Work also included working on some consulting projects and providing guidance.

May-July 2015 | Summer Intern at Uurmi Systems, Hyderabad
Embedded Hardware and Controller designing
Designed and developed a controller and the required embedded hardware for autonomous car project. Work also involved developing a controller for Crazyflie quadcopter, to make it follow a Nintendo Wii remote.

2014 - 2017 | Teaching Assistant for various Courses at IIIT-Hyderabad
• Digital Logic and Processors (3 semesters) • Embedded Hardware Design
• Communication Theory - 1 • Introduction to Robotics

2015 - 2016 | Student Placement Coordinator, IIIT-Hyderabad

Publications

Learning Multi-Goal Inverse Kinematics in Humanoid Robot
International Symposium on Robotics (ISR), 2018.
A Deep Reinforcement Learning Approach for Dynamically Stable Inverse Kinematics of Humanoid Robots
IEEE International Conference on Robotics and Biomimetics (ROBIO), 2017.
Design and Development of a Humanoid with Articulated Torso
IEEE International Conference on Robotics and Automation for Humanitarian Applications (RAHA), 2016.
Stair Climbing Using a Compliant Modular Robot
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015.

An Improved Compliant Joint Design of a Modular Robot for Descending Big Obstacles
ACM Proceedings of the 2015 Conference on Advances In Robotics (AIR), 2015.

Papers in Submission

Learning Dual Arm Coordinated Reachability Tasks in a Humanoid Robot with Articulated Torso
IEEE RAS International Conference on Humanoid Robots, 2018

Projects

Motion Transfer from Human to Humanoid
Human motion captured via Vicon motion capturing system was transferred onto a humanoid robot using Inverse Kinematic motion planning.
Path planning and collision avoidance
Devised and implemented a methodology for path planning and collision avoidance of a differential drive wheeled robot for both static as well as dynamic obstacles using RRT and velocity cones.
Localization
Implemented localization of a robot in a known environment using Markov and Extended Kalman Filter methods.
Finger print recognition using MKL-SVM
Developed a method for finger print recognition using Multi Kernel Learning Support Vector Machine as the base learner and different image processing techniques for feature extraction.
Hand written Digit Recognition
Implemented forward pass and back propagation of a 3 layered fully connected neural network for hand written digit recognition.
Text to emotive speech synthesis
Implemented text to speech synthesis system using Festival framework. System was then extended to synthesize speech in 5 different emotions using MATLAB.
4 bit processor
Designed and implemented a simple architecture of a 4 bit processor in VHDL and Cadence (schematic and Layout).

Mini Projects

• **Mini Electronic Keyboard** • **Encoded wireless transmission and reception system**
• **Design and automation of a 1-D gantry crane** • **A study on various image interpolation techniques**

Skills

Operating Systems:	GNU/Linux (Ubuntu, Fedora), Windows
Programming Languages:	C,C++, Embedded C, Python, MATLAB
Simulators and Tools:	MSC Adams, Mujoco, SolidWorks, Xilinx, Cadence, Multisim
Platforms and Libraries:	ROS, Simulink, Arduino and AVR, Tensorflow, OpenCV, LaTeX

Coursework

Robotics:	Statistical methods in AI Linear control systems	Computer Vision Mobile Robotics	Intro to Robotics Design of Mechanisms
Electronics:	Embedded Hardware Design Digital Logic and Processors	Intro to VLSI	Network Theory
Communication: and signals	Communication Theory-1 Wireless communications	Signals and Systems Speech Systems	Digital Signal Processing Info. Theory and Coding

Leadership and workshops

Pulsation Coordinator, Felicity '15 (IIIT-H Techno-Cultural Fest)
Organiser, Robocamp '14 : IIIT-H Robotics Club, Microsemi (A week long workshop on robotics)
Team Leader, Electronics Hackathon '14, IIIT-H
Team member, RoboCon, 2014, IIIT-H
Team member, CanSat, 2015, IIIT-H
Intel Workshop on CV, 2013, Bangalore