Phani Teja Singamaneni

Contact Information

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Education

July 2012 B.Tech and MS by Research, Electronics and Communication Engineering
(Expected Graduation: May 2018)
International Institute of Information Technology, Hyderabad, India
Thesis topic: "RL based motion planning and control of a Humanoid robot"
Advisors: K. Madhava Krishna, Abhishek Sarkar
Gpa: 8.97/10

Experience

Current / **Aug 2015** | Research Assistant at Robotics Research Center, IIIT-Hyderabad
Designing a novel reinforcement learning frame work for complex tasks in Humanoid robot (current). Work also includes 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.

Aug 2014 - 2017 | Teaching Assistant, IIIT-Hyderabad
• Digital Logic and Processors (Head TA) • Embedded Hardware Design
• Communication Theory-1 • Introduction to Robotics

2015-2016 | Student Placement Coordinator, IIIT-Hyderabad

Research Interests

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

Publications

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

DiGrad: Multi-Task Reinforcement Learning for Shared Action Spaces
European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD), 2018
Learning Coordinated Tasks using Reinforcement Learning in Humanoids
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018

Projects

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.
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 in real time.
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**

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

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

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.

Volunteer work, 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
Volunteer for Photography Club, Robotics Club, Convocation '12 and Hackathons conducted in college
Student mentor, 2014, IIIT-H