

Vinaykumar Hegde

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EDUCATION

UNIVERSITY OF SOUTHERN CALIFORNIA (USC)

MS in Electrical Engineering
Expected Graduation: May 2016
Los Angeles, CA
CGPA: 3.95/4

VISVESVARAYA TECHNOLOGICAL UNIVERSITY (VTU)

BE in Electronics and Communication Engineering
R. V. College of Engineering | Bangalore, India
Graduation: Jun 2011
CGPA: 9.13/10

COURSEWORK

GRADUATE

Linear Algebra (EE441)
Probability (EE503)
Robotics (CSCI545)
Computer Vision (CSCI574)
Machine Learning (EE660)
Coordinated Mobile Robotics (CSCI599, Audit)
Pattern Recognition (EE559)
Linear Systems (EE585)

UNDERGRADUATE

Real Time Embedded Systems
Artificial Neural Networks
Computer Organization & Architecture

CERTIFICATIONS

Machine Learning - Coursera
Design & Analysis of Algorithms 1 - Coursera
Scalable Machine Learning - EdX.

SKILLS

PROGRAMMING

C/C++ • Python • MATLAB

ROBOTIC PLATFORMS

ROS • Gazebo • iRobot Create • Nao • SL Simulator • Kinect • Arduino • AR Drone • Nvidia Jetson TK1

OTHER LIBRARIES

OpenCV • IPython • IPython.Parallel • Scikit-learn • numpy • Theano • Keras • Starcluster

RESEARCH

DIRECTED RESEARCH ON INDOOR MOBILE ROBOT NAVIGATION

Jan 2016 – Current | Advisor: Prof. Laurent Itti | USC, Los Angeles

- Designing a low cost hardware/robot for Indoor Mobile Navigation Robot studies.
- Developing ROS packages and ROS messages to control mobile robot.
- Using Kinect/Asus Xtion pro for RGBD SLAM and Indoor Navigation.
- Researching on using low cost IR and Ultrasonic sensors for surprise detection in indoor navigation.

RESEARCH ON MOBILE ROBOTS FOR CRACK DETECTION

Sep 2015 – Dec 2015 | Advisor: Prof. Sami Masri | USC, Los Angeles

- Integrated ROS and other packages for iRobot Create 1 robot and ASUS Netbook.
- Developed a ROS node to capture the image and feed it to crack detection system.
- Keywords: ROS, OpenCV, IMU, Localization.

DIRECTED RESEARCH ON BIO-NANO ROBOTS

Sep 2014 – Nov 2014 | Advisor: Prof. Edmond Jonckheere | USC, Los Angeles

- Conducted a literature survey on Bio-Nano Robots and their control.
- Studied different techniques for controlling these robots using magnetic fields and gradients.
- Studied techniques for using existing MRI machines to propel nano robots for drug delivery.

EXPERIENCE

DIGITAL DESIGN ENGINEER - TEXAS INSTRUMENTS

Jul 2011 – Jul 2014 | Bangalore, India

- Designed and characterized Standard Cells for TI's processes.
- Developed automation flows for characterization.
- Designed Python based web-server for Digital Design Margin Calculator.
- Co-authored a paper on "Surprise or Shock? Transistor level functional analysis of digital circuits and systems are still needed!". Received best paper awarded at CDN live 2014, India.

PROJECTS

CIFAR-10: OBJECT DETECTION IN IMAGES

(Fall-2015/Course: EE660/Instructor: Prof. Keith Jenkins)

- Compared object detection techniques on CIFAR-10 dataset (SVM, Adaboost and Neural Networks). Achieved 78% accuracy using CNN with Keras and Theano.
- Keywords: Keras, Theano, IPython Parallel, Starcluster, AWS, HOG, BOF

HETEROGENEOUS COORDINATED ROBOTS FOR NAVIGATION

(Spring-2015/CSCI599/Prof. Nora Ayanian)

- Navigating ground robot (Turtlebot) using live feed data (image) from AR Drone quadcopter.
- Implemented the idea on ROS and Gazebo.

HUMAN ACTIVITY RECOGNITION FROM INERTIAL SENSOR DATA

(Spring-2015/EE559/Prof. Keith Jenkins)

- Using pattern recognition and machine learning techniques to predict the human activities like walking, standing, sitting and laying. Used mobile phone inertial sensors dataset from UCI repository.
- Tools used: Python, Scikit-learn, numpy

BALANCING NAO ROBOT IN ONE LEG

(Spring-2015/CSCI545/Prof. Stefan Schaal)

- Using Inverse kinematics, minimum jerk/cubic spline controls, and COG Jacobian techniques to balance the Nao Robot in single leg.
- Implemented the idea using SL simulator.

AVIONICS PROJECT

Undergraduate Senior Project

- Developed IMU sensors interface and control algorithms for quadcopter on LPC2148 ARM controller.
- Designed wireless video transmission system for UAVs. Developed 24fps QVGA video transmission system using OMAP3, Embedded Linux and WiFi.
- Designed data acquisition system and radio transceiver for Unmanned Aerial Vehicles with LabVIEW and ZigBee.

STUDENT SATELLITE PROJECT

Undergraduate Junior Project

- Developed device drivers for CC1020/CC1070 transceivers and AX.25 protocol on Atmel AVR32-32 bit microcontrollers.
- Simulated bit error rate in space using Simulink/Matlab.