# Vinaykumar **Hegde**

720 W 27th Street, Apt #224, Los Angeles, CA - 90007
http://vnay.in | vinaykuh@usc.edu | 213.610.3742

## 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.

### Online Courses
Deep Learning - Udacity
Autonomous Mobile Robotics - EdX

## SKILLS

### Programming
C/C++ • Python • MATLAB

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

### Other
Git • 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. 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 mobile robot navigation.

## 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.

## 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, SIFT

### Heterogeneous Coordinated Robots for Navigation
(Spring-2015/Course: CSCI599/Instructor: 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/Course: EE559/Instructor: 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/Course: CSCI545/Instructor: 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.

### Mobile Robots for Crack Detection
Sep 2015 – Dec 2015 | Dynamics Lab
- 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.

### 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.