Sudeep Fadadu

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Education

2011–*present* (expected - 2015)	Bachelor in Electronics and Communication Engineering, International Institute of Information Technology, Hyderabad, India (IIIT-H) Honors | Specialization: *Robotics*
2009-2011	Higher Secondary Education at Utkarsh Vidyalaya, Vadodara, India Affiliation: GHSEB | Specialization: Science (PCM) *Aggregate*: 86.00%
1998-2009	Primary and Secondary Education at Vidya Vihar, Vadodara, India Affiliation: GSEB | *Aggregate*: 92.15% Graduated top of the class with *Gold Medal for All-Round Excellence*

Academic Interests

Probabilistic Modeling and Reasoning
Modeling of complex surrounding for scene understanding. Have been studying structured probabilistic models in supervised and unsupervised settings using undirected and directed graphical models in Machine Learning context.

Artificial Neural Networks
Linear approximation of complex perception and navigation functions, enabling system to cognitive processes. Have been studying principles of neural network, Activation and Synaptic Dynamics, feed-forward neural networks, back-propagation learning.

Human - Robot Interactions
Developing real-time solutions which involve robotic manipulation under human presence. Have been studying Game Theory and Theory of Social choices to predict the behavior of a client, and have been working on related projects.

Work Experience

May ’13 - *present*	**Research Assistant** at Robotic Research Center, IIIT-Hyderabad, India. Developing real-time autonomous solutions from embedded circuit to sophisticated artificial intelligent software
Aug ’14 - *present*	**Teaching Assistant** for Mobile Robotics course at IIIT-Hyderabad, India. Taken by Dr. K Madhav Krishna. The responsibility involved taking tutorials, evaluating assignments and mentoring projects. (~45 UG and Graduate students)
Jan ’14 – *May ’13*	**Teaching Assistant** for Electronic Workshop-I course at IIIT-Hyderabad, India. Taken by Dr. Rambabu. The responsibility involved conducting lab tutorials, evaluating lab assignments and mentoring projects. (~60 freshmen)
Jan ’13 – *Aug ’13*	**Software Intern** at Slave Technologies. Developed a robust and computationally efficient program for user interface based on body gestures using OpenCV and PCL libraries.
May ’12 – *Aug ’13*	**Summer Intern and Trainee** at Technophilia Systems Worked on Image segmentation for mobile robots to follow a specified object. Completed iCarnegie training program conducted by Carnegie Mellon University

Research Projects

Autonomous Car (Mar'2014 - *present*)

Mentor: Dr. K Madhav Krishna RRC, IIIT-Hyderabad

Developing a fully autonomous outdoor vehicle for urban surroundings, which includes reconstruction and segmentation from stereoscopic vision, probabilistic framework for mapping, stereo-vision based visual odometry, global path planning using GPS and IMU sensors and local path planning based on stochastic fusion of sensory input and current map. Also developing robust and computationally efficient lane detection, obstacle tracking and simultaneous localizing method.

Autonomous Robotic Wheelchair (May'2013 – Aug'2014)

Mentor: Dr. K Madhav Krishna RRC, IIIT-Hyderabad

Enabled a wheelchair with localization, navigation in known/ unknown map, SLAM, exploration, robust perception, A* and RRT based path planning and navigation, embedded circuit for PID and motor control, and robust human detection and tracking for generating socially agreeable path in future. (Team of 3 | Video link)

Human Detection and Tracking in 3D space (May'2014 – *Aug'2014*)

Mentor: Dr. K Madhav Krishna RRC, IIIT-Hyderabad

Developed a real time algorithm to detect, track and label multiple pedestrian in current RGB-D view frame. Algorithm uses Histograms of Oriented Gradient (HOG) and previous detection results as a prior knowledge for detection and tracking. Implemented in C++ using PCL and OpenCV libraries on ROS framework. (Video link)

HDR Image Reconstruction from LDR Images (Jun'2013 – Dec'2013)

Mentor: Dr. Jayanti Shivaswami CVIT, IIIT-Hyderabad

Developed an algorithm to generate HDR image from 4 LDR images taken with different exposure time from normal camera. Motion of camera during exposure is estimated for each image and by applying non-uniform deblurring and fusion we recover High Dynamic Range image. (Team of 2 | Detailed Report | Results)

Exploration of Surrounding by Mobile Robot (Sep'2013 – Dec'2013)

Mentor: Dr. K Madhav Krishna RRC, IIIT-Hyderabad

developed an AI to smartly explore and map the surrounding while keeping the navigation cost minimum. It uses gmapping algorithm to generate an accurate 2D map which can be used for navigation. (Team of 2 | Video Link | Results)

RoboCon - 2014 (Oct'2013 - *Mar'2014*)

Mentor: Dr.Suril Shah and Dr. K Madhav Krishna RRC, IIIT-Hyderabad

Designed an autonomous robot which climbs ladders and traverses through uneven terrain by grabbing poles for support. (Team Leader | Team of 17)

vPLAY (Virtual Play Ground) (Jan'2013 – Mar'2013)

Mentor: Daniel Leithinger and Anirudh Sharma MIT Media Lab

Developed a Tangible User Interface (TUI) system to interact with virtual objects in real environment, vPLAY is a platform where user can play with virtual objects in real world. (Team of 5)

DensMeter (Portable density measurement device) (Jan'2013 – Apr'2013)

Mentor: Dr. K.R.Sharma IIIT-Hyderabad

Developed a portable device which can determine density of unknown material using acoustic wave properties in material, in both real and complex domain. (Team of 2 | Detailed Report)

Other Academic Projects

- Foreground-Background Estimator for surveillance using Background Mixture Model (Link)
- Handwritten Text Binarization using power-law transformation (Link)
- Localize logo of a TV channel (Link)
- NAYANiX – Linux based Operating System for Blind (Link)
- Analyzing Deformable Part Models for different objects (Link)
- Control System for Inverted Pendulum (Link)

Skills

Programming and Scripting	C/C++, ARM Assembly, Python, bash
Operating System	GNU/Linux, Win32
Hardware Description Language	VHDL
Embedded	Xilinx IDE, ATMEL, PIC, Arduino, Raspberry pi
Testing	Multisim, Simulink, ModelSim, Tanner EDA
Programming/Computing	MATLAB, LABView, MS VisualStudio, Processing, Octave
Libraries and tools	OpenCV, PCL(Point Cloud Library), ROS(Robot Operating System), ARIA, SolidWorks

Courses

System Courses	Computer Systems Organization, Engineering Systems, Intro to VLSI, Operating Systems
Theoretical Courses	Probability and Random Processes, Algorithms, Data Structures, Time Frequency Analysis, Electromagnetic Theory and Applications, Communication Theory
Robotics, AI and Vision Courses	Mobile Robotics, Artificial Intelligence, Artificial Neural Network, Computer Vision, Digital Image Processing, Design of Mechanism, Advances in Robotics and Control
Foundation Courses	Digital Logic and Processor, Computer Programming, Basic Electronic Circuits, Linear Electronic Circuits, Signals and Systems, Digital Signal Processing

Achievements

Selected for the second round of ***NI-YANTRA*** embedded system design contest, 2012 conducted by National Instruments. (*NAYANiX*- Operating System for Blind People).

All India Rank of ***8960****(*out of 468,240*)* in the prestigious examination *IIT-JEE'11*.

All India Rank of ***3245***(out of 1,114,880) in *AIEEE'11* with a state rank of 67 (Gujarat).

All India Rank ***256*** in *National Science Olympiad (NSO)* organized by Science Olympiad foundation (SOF) in the year 2010.

All India Rank ***125*** in *International Mathematics Olympiad (IMO)* organized by Science Olympiad foundation (SOF) in the year 2010.

Selected for the ***NSDC*** *(National Science Day Celebration 2010)* at Physical Research Laboratory.

Declaration: I hereby declare that the above information is correct to the best of my knowledge.

Last updated: November 10, 2014.