Nitish A Gupta

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EDUCATION

University of Central Florida   Orlando, FL
M.Sc. *in Computer Engineering (GPA: 3.84)*   *Aug. 2016 – Aug. 2018*
Thesis: Real-time SIL Emulation Architecture for Cooperative Automated Vehicles
Research: Intelligent Transportation Systems, Robotics & Automation, Vehicular Networks, ADAS

University of Mumbai   Mumbai, India
B.Eng. *in Electronics Engineering (GPA: 3.90)*   *Aug. 2010 – May 2014*
Ranked *1st* amongst 120 students in the Electronics dept.
Second year representative and Head of creative team at Annual college festival – *Pegasus*

WORK EXPERIENCE

NHK International Corporation   Novi, MI
Research Engineer - Research & Analysis Team   *Nov. 2018 - Present*
- Prototyping and Development of factory automation systems based on robotics and SOTA computer vision algorithms for a highly dynamic industrial environment
- Developed Pipeline to acquire point cloud data from sensor, integration with ROS, point cloud segmentation, model fitting using RANSAC and ICP, model perception, robot motion & path planning with Moveit, and supported with a Qt-based GUI

Networked Systems Laboratory at UCF   Orlando, FL
Graduate Research Assistant   *Feb. 2017 - Aug. 2018*
- **Real-Time SIL Emulator for ADAS Testing and Validation** – *Sponsor: Ford Motor Company*
  Designed and developed a unique and easily configurable emulation/simulation architecture to allow Software-In-Loop testing and validation of connected vehicle applications
- **Small-scale Connected Autonomous Vehicle** – *Sponsor: NSL*
  Mentored a team of 5 undergraduate students to build a fleet of vision sensors equipped small-scale autonomous vehicles to navigate using advanced planning algorithms and thus provide a test-bed for V2X safety applications
- **Vehicle Safety Communications Applications** – *Sponsor: CAMP*
  Research and development in DSRC based V2V Safety Networks, Model-based Information Networking for situation awareness in Automated vehicles

Giant Health Events   London, UK
Machine Learning Intern   *May 2017 - June 2017*
- Built models based on SVM and Regression techniques to predict potential event attendees from the scrapped social network data and thus reduce human efforts and increase business

Tata Consultancy Services Ltd.   Mumbai, India
Business Intelligence Developer   *Sept. 2014 - July 2016*
- Migrated 95 high-complexity reports into production (Business Objects and Crystal reports to Microstrategy) in a team of four members (Agile) within a period of 3 months
- Developed Interactive reports in Microstrategy to calculate and analyze financial tax for ABN-AMRO bank

TECHNICAL SKILLS

Languages: C, C++, Python, MATLAB, Embedded C, Java, Assembly, Verilog, UNIX, SQL, LaTeX
Hardware: LiDAR, Stereo Camera, Nvidia Jetson TX2, Arduino, Raspberry Pi, ARM, TI-MSP, FPGA
Libraries: PCL, VTK, OpenCV, Eigen,TensorFlow, Keras, TFLearn, Pandas, Scikit-learn, SciPy
Tools: ROS, Moveit, CloudCompare, NS3, SUMO simulator, Git, Linux scripting, Qt, Visual Studio Code

PROJECTS

Vehicle Detection and Tracking *Oct. 2017 Nov. 2017*
- Trained an SVM classifier to distinguish between car and non-car images with 98.56 % accuracy
- Accurately tracked vehicles using a stream of sliding bounding boxes of different scales
- Developed a heat-map of all positively detected vehicles to remove false positive based on a threshold

Drivers Behavior Cloning *Sep. 2017 Oct. 2017*
- Designed a CNN to predict steering wheel angles in a challenging simulated environment based on the human driving behavior (Validation Loss < 0.35%)

Traffic Sign Classification using Camera *Aug. 2017 Sep. 2017*
- Built and fine-tuned a CNN over a small dataset to classify traffic signs, using a mounted camera
- Attained 97% test accuracy on a German traffic sign dataset

Autonomous Rescue Robot *Feb. 2017 Apr. 2017*
- Built a 4-wheeled autonomous car for search and rescue operations in a disaster-affected area to explore and identify victims
- Programmed ROS (Robot Operating System) nodes for gathering the odometry data along with the scans from a Kinect sensor (to create 2D Occupancy maps) into a raspberry pi
- Implemented a Particle Filter for localization and a Path Planning algorithm for navigation to various goals using offline maps created during the training phase

Path Planning and Q-Learning in a grid world *Feb. 2017 Mar. 2017*
- Implemented A-star path planning algorithm with Manhattan and Euclidean distance choice in an interactive grid world GUI using pythons tkinter library
- Designed a Reinforcement learning engine with deterministic and stochastic behavior in the grid world

Concurrent Physics Engine *Oct. 2016 Nov. 2016*
- Linearized a Physics Engine consisting of circles moving with random velocities around the screen and colliding with each other
- Implemented concurrent (Lock-free) version of SAP (Sweep and Prune) and Hash grid

Surveillance based on Tracking and Targeting *Oct. 2013 Mar. 2014*
- Built a MATLAB based security system to tackle the situations like 26/11 Mumbai terrorist attacks
- Led a team of three members to develop a real-time object detection and tracking algorithm, which controlled a camera-laser mounted robotic arm to continuously track and target the suspect

CERTIFICATIONS

Coursera: Machine Learning by Andrew Ng
Udacity: Self-Driving Car Nanodegree – Term 1, Robotics Engineer Nanodegree

PUBLICATIONS

1. G. Shah, R. Valiente, N. Gupta, SM Gani, B. Toghi, Y. P. Fallah, S. D. Gupta, "Real-Time Hardware-In-the-Loop Emulation Framework for DSRC-based Connected Vehicle Applications", 2nd IEEE Connected and Automated Vehicles Symposium, Sept., 2019

2. Gupta, Nitish, "Real-time SIL Emulation Architecture for Cooperative Automated Vehicles" (2018). Electronic Theses and Dissertations, University of Central Florida. 6047.

3. N. A. Gupta, S. J. A. Raza, G. R. Sukthankar, N. Chitalaya, "Real-World Modeling of Path Finding Agent Using Robot Operating System (ROS)", FCRAR, vol.30, May 2017