# Nitish Gupta

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## EDUCATION

**University of Central Florida** — Orlando, FL

***M.Sc.*** *in Computer Engineering (GPA: 3.82)* — *Aug. 2016 – July 2018*

Research: Wireless vehicular networks, Vehicle Safety, ADAS, Intelligent Transportation Systems

**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

**Networked Systems Laboratory at UCF** — Orlando, FL

*Graduate Research Assistant* — *Feb. 2017 - Present*

- **Advance Vehicle Emulator** – *Sponsor: Ford Motor Company*
  Developing a unique and easily configurable emulation/simulation setup to allow Hardware in the Loop (HIL) testing of connected vehicle applications in a realistic and safe manner
- **Small-scale Connected Autonomous Vehicle** – *Sponsor: NSL*
  Mentoring a team of 5 undergraduate students to built 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**: TensorFlow, Keras, TFLearn, Scikit-learn, SciPy, OpenCV, PCL

**Tools**: ROS, NS3, SUMO simulator, Xilinx, Git, Linux, Visual Studio, Microstrategy, Business Objects

## 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

## *PUBLICATIONS*

Nitish A. Gupta, Sayyed Jaffar Ali Raza, Gita R. Sukthankar, Nisarg Chitalaya, Real-World Modeling of Path Finding Agent Using Robot Operating System (ROS), FCRAR, vol.30, May 2017