

# Nitish A. Gupta

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## EDUCATION

### University of Central Florida, USA

Aug 2016 – July 2018

- Master of Computer Engineering – Thesis (*sp.* Intelligent systems)

GPA: 3.82/4

### University of Mumbai, India

Aug 2010 – May 2014

- Bachelor of Engineering (Electronics Engineering)

GPA: 3.90/4

## WORK EXPERIENCE

### University of Central Florida, USA

Feb 2017 – Present

#### *Graduate Research Assistant, Networked Systems Laboratory*

- Research sponsored by NSF, USDoT, CAMP, Toyota, Hyundai, General Motors
  - DSRC V2V Safety Networks, Communication and Congestion Control (VSC-A) for Automated Vehicles
  - Autonomous Vehicles, Model-based Information Networking and Situation Awareness
- Research sponsored by Ford Motor Company
  - Designing a DSRC based emulator for implementing Vehicular safety based applications
  - Evaluation and Testing of the DSRC based applications on the LTE-V2X
- Building a fleet of Cooperative Autonomous Cars of scale 1/10 to test VSC-A in Lab environment

### Giant Health Events, UK

May 2017 – June 2017

#### *Machine Learning Intern*

- Programmed a Support Vector Machine and Regression models to train on the scrapped data from LinkedIn and classify potential customers and speakers who might be interested in attending the event
- Training dataset was the previous year's attendees' information

### Tata Consultancy Services Ltd., India

Sep 2014 – July 2016

#### *Business Intelligence Developer*

- Migrated 95 high-complexity reports into production (Business Objects and Crystal reports to Microstrategy) within 3 months, along with a team of four members (Agile methodology)
- Developed Interactive reports in Microstrategy to calculate & analyze financial tax for ABN AMRO bank

## SKILLS

**Hardware** : LiDAR, Stereo Camera, Nvidia Jetson TX2, Arduino, Raspberry Pi, ARM, TI-MSP, FPGA

**Software** : C, C++, Python, Embedded C, Java, Assembly, Verilog, UNIX, SQL, JavaScript, HTML/CSS

**Libraries** : TensorFlow, Keras, TFLearn, Scikit-learn, SciPy, OpenCV, PCL

**Tools** : ROS, MATLAB, NS3 simulator, SUMO simulator, Xilinx, LabVIEW, Visual Studio, Git, Linux, Cascade Version Manager, Microstrategy, Business Objects

## ONLINE COURSES

- Self-Driving Car Nanodegree Program at Udacity
- Convolutional Neural Networks for Visual Recognition at Stanford University
- Artificial Intelligence for Robotics at Udacity
- Machine Learning at Stanford University

## RESEARCH PROJECTS

- Designing of Cooperative Autonomous Vehicles – NSL Lab** **Sep 2017 – Present**
- Developing a fleet of Cooperative Autonomous Vehicle that can Localize, Navigate and Plan its path dynamically using Lidar, Stereo cameras and other local sensors
  - Cooperation and VSC-A is achieved by communication of Map data over the DSRC channel
- Advanced Connected Vehicle Emulator (Master's Thesis) – Ford Motor Company** **July 2017 – Present**
- Modelling a system wherein a couple of DSRC devices can emulate multiple different virtual vehicles over a given Map and communicate with DSRC equipped real vehicles
- Adaptive Content Control amongst Cooperative Automated Vehicles – NSF** **Feb 2017 – Apr 2017**
- Implemented adaptive packet length control in a vehicular broadcast medium to avoid congestion
  - Tested two variants, deterministic inclusion and probabilistic inclusion of communicated nodes
  - Simulated using NS3 with different trajectories for 100, 500 and 1000 vehicles at a given vehicle-density

## ACADEMIC PROJECTS

- Driver's Behavior Cloning – Self-Driving Car Nanodegree** **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 – Self-Driving Car Nanodegree** **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 – Intelligent Systems** **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 3
  - 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 – Intelligent Systems** **Feb 2017 – Mar 2017**
- Implemented A-star path planning algorithm with Manhattan and Euclidean distance choice in an interactive grid world GUI using python's *tkinter* library
  - Designed a Reinforcement learning engine with deterministic and stochastic behavior in the grid world
- Concurrent Physics Engine – Multicore Programming** **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 - Tracking and Targeting – Senior Design Project** **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

## ACHIEVEMENTS & EXTRACURRICULAR

- Deans' award for securing 2nd rank amongst all departments during bachelor degree
- Elected as a Sophomore representative in the council team of *Pegasus* – annual college festival
- Managed a team of 20 members as a head of creative team in *Pegasus* festival

## 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