SURAJ MANIYAR

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EDUCATION

- **Master of Science in Electrical Engineering (Specialization: Computational Intelligence)**   **GPA: 3.66/4.0**
  North Carolina State University, Raleigh, North Carolina   Aug 2017 – May 2019
  Courses: Computer Vision | Neural Networks | Probabilistic Graphical Models | Design of a Robotic Computer Vision System for Autonomous Navigation | Data Science | Digital Imaging Systems | Spatial and Temporal Data Mining

- **Bachelor of Technology in Electronics Engineering**   **GPA: 7.72/10.0**
  Veermata Jijabai Technological Institute (VJTI), Mumbai, India   Jun 2013 – Jul 2017

WORK EXPERIENCE

Kitware Inc. , Carrboro, North Carolina   Feb 2019 - May 2019
Research and Development Intern
- Developing and exploring deep learning methods for digital pathology image analysis mainly focusing on *multiple-instance learning* of deep convolutional networks for whole slide classification
- Improving methods for nuclei detection, image segmentation and classification of digital histopathology images

TECHNICAL SKILLS

Programming Languages	**:**	Python, C, C++, Java, Shell scripting, SQL, R
Frameworks & Tools	**:**	PyTorch, Tensorflow, Keras, STL (C++), OpenCV, Pandas, Numpy, Scipy, scikit-learn, Git
Softwares & OS	**:**	Linux (Ubuntu), Windows, ROS, MATLAB, Visual Studio, LabVIEW

ACADEMIC PROJECTS

Activity Recognition from Video *(Python, Keras)*   May 2018 - Aug 2018
- Implemented activity recognition task using Convolutional and Recurrent Neural Net as a part of Independent Research Study to benchmark a custom hardware accelerator at NC State University
- Improved accuracy from **40%** to **70%** using *Transfer Learning* on *VGG-16* network for 7 activities on UCF-101 dataset

Design of a SLAM System for Autonomous Robot *(ROS, C++, Python, OpenCV)*   Jan 2018 - May 2018
- Localized aerial robot blimp using different algorithms like *VINS-Mono* and *ORB SLAM2* and obtained 3D point cloud of the environment by incorporating visual and odometric data
- Technology used: NVIDIA Jetson TX1, Raspberry Pi, BNO055 IMU, Raspberry PiCam, Point Cloud Library (PCL), ROS

Deep Visual Attention Prediction using skip-layer network *(Python, Tensorflow, OpenCV)*   Apr 2018
- Replicated results of the paper: '*Deep Visual Attention Prediction*' to predict human eye fixation on view-free scenes
- Improved accuracy to **74%** by incorporating multi-level saliency predictions from skip layers

Image Segmentation using Markov Random Field (MRF) *(Python, OpenCV)*   Dec 2017
- Segmented chambers of foraminifera (marine species) from its edge probability map using *Graph-Cut (MRF)* approach
- Improved accuracy to **71.40%** by using morphological refining before applying watershed transformation

Respiratory Rate Estimation using Hidden Markov Model and Neural Network *(Python, Tensorflow)*   Dec 2017
- Predicted respiratory rate of an individual based on accelerometer data, heart rate and body temperature using *Ridge Regression* and *Neural Networks* with a Root Mean Squared Error (RMSE) of **3.38**
- Reduced the error by **20%** by incorporating temporal dynamics using *Hidden Markov Model* (HMM)

Stock Trading using Machine Learning *(Python, Keras, Pandas)*   May 2017
- Developed portfolio management system using *Reinforcement Learning* and *Neural Networks* to learn trading strategies
- Employed fundamental and technical analysis commonly used by investors to select optimal stocks to invest in

Task Learning Robot *(LabVIEW)*   Nov 2015
- Shortlisted in the **top 20** at *national level* contest, NIYANTRA, organized by National Instruments, India. Implemented a computer-vision based approach for *'Robot Learning from Demonstration'* on industrial robotic arm Scorbot ER-VII

CO-CURRICULAR ACTIVITIES

- Served as senate member of *Society of Robotics and Automation* at VJTI dealing with *robotics, machine vision, automation* and *student-mentorship programmes* in robotics from 2014-2017
- Managed and conducted workshops with a team of 10, to teach freshmen and sophomores about *line-following robots, embedded systems, Bluetooth technology* and *Internet of Things (IoT)*