

# Nandiraju Gireesh

4<sup>th</sup> year Undergraduate Student

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## EDUCATION

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**Birla Institute of Technology and Science – Pilani, Hyderabad Campus**      Telangana, India  
*B.E. (Hons.) in Electronics and Instrumentation*      August 2017 – May 2021

## RESEARCH EXPERIENCE

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### AI-for-Healthcare Lab, UC San Diego

Research Intern (Remote)

**Advisor: Prof. Pengtao Xie**

March 2020 – Current

- We developed methods to generate view-consistent, high-fidelity, and high-resolution X-ray images from Radiology reports to facilitate radiology training of medical students. ([Paper](#))
- Our method beats previous state-of-the-art methods like VanillaGAN, StackGAN, AttnGAN by 17.7% and 15.8% on OpenI & MIMIC-CXR datasets on Visual Consistency measure respectively.
- We are currently working on applying Supervised Contrastive methods for Semantic Segmentation to achieve more accurate results than the current ones.

## PUBLICATIONS & PRE-PRINTS

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1. *XRayGAN: Consistency preserving Generation of X-Ray images from Radiology Reports*  
Xingyi Yang, **Nandiraju Gireesh**, Eric Xing, Pengtao Xie (In Review)

## SKILLS

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- **Programming Languages:** Python, C++, Bash
- **Frameworks:** PyTorch, TensorFlow, Keras, fastai, OpenCV, ROS, OpenAI Gym, MuJoCo
- **Tools:** Kubernetes, Docker, GIT, Jupyter, Gazebo, Google Colab

## PROJECTS

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### Vehicle Detection and Tracking Project

February 2020

*(Object Detection, Computer Vision, Deep Learning, TensorFlow)*

- Built a software pipeline which detects vehicles in a video stream and outputs an annotated video stream with a bounding box over vehicles detected.
- Performed a Histogram of Oriented Gradients (HOG) feature extraction on a labeled training set of images and trained them using a Linear Support Vector Machine Classifier (SVM).
- Combined my previous lane-finding algorithm to this project and produced a simultaneous lane-finding and vehicle detected annotated video as output.

## **Behavior Cloning**

February 2020

*(Imitation Learning, Computer Vision, Deep Learning, TensorFlow)*

- Trained a Deep Neural Network using TensorFlow that replicates human steering behavior while driving, thus being able to drive autonomously on a simulator with an accuracy of 98%.
- The model is partially based on NVIDIA's network architecture mentioned in their research paper "End to End Learning for Self-Driving Cars".
- This network takes as input the frame of the frontal camera (say a roof mounted camera) and predicts the steering direction at each instant.

## **Traffic Sign Recognition Classifier**

January 2020

*(Image Recognition, Computer Vision, Deep Learning, TensorFlow)*

- Built and trained a Deep Neural Network which decodes traffic signs from natural images by using German Traffic Sign Dataset.
- The model is based on LeNet Architecture, which is a Convolutional Neural Network designed to recognize visual patterns directly from pixel images with minimal pre-processing.
- Implemented the model using TensorFlow and Scikit-learn's Pipeline framework, which showed an accuracy of 96% on Test Dataset with 500 epochs on CPU.

## **Finding Lane Lines on the road for Autonomous Vehicles**

January 2020

*(Image Processing, Computer Vision, Python)*

- Built a pipeline that identifies lane lines taking road images from video as input and returns an annotated video as output.
- Applied Canny Edge Detection, Region of Interest Selection and Hough Transform Line Detection techniques and processed the video clips to find lane lines in them.
- Used Python and OpenCV to build the pipeline and the whole model was built in Jupyter Notebook.

## **RELEVANT COURSES (ONLINE)**

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- CS 285 - Deep Reinforcement Learning, Decision Making, and Control – Prof. Sergey Levine (Current)
- Self-Driving Car Engineer Nanodegree – Udacity – (Auditing) (Current)
- Practical Deep Learning for Coders – fast.ai
- Deep Learning from the Foundations – fast.ai

## **SCHOLARSHIPS**

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Prime Minister's Scholarship Scheme

(May 2018 - Present)