

# ROHITH GANDHI GANESAN

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## EDUCATION

### New York University - Tandon School of Engineering

December 2020

Master of Science in Informatics, *GPA: 3.7/4*

Coursework: Data Science, Big Data, Machine Learning, Natural Language Understanding, Deep Reinforcement Learning

### PSG College of Technology

May 2018

Bachelor of Engineering in Computer Science, *GPA: 7.3/10*

Coursework: Advanced Data Structures, Design & Analysis of Algorithms, Distributed Systems, Object Oriented Programming

## TECHNICAL SKILLS

### Programming Languages

Python, C++, C, SQL, Java, JavaScript

### Frameworks

Pytorch, Tensorflow, Sklearn, PySpark, SparkML, NLTK, Spacy

### Tools & Techniques

Git, Docker, PostgreSQL, MySQL, MapReduce

### Softwares, Cloud Platforms & OS

Google Cloud, AWS, Linux, R

## EXPERIENCE

### *Research Assistant*, New York University - RiskEcon<sup>®</sup> Lab (Courant) and ARPL lab (Tandon) Aug. 2020 - present

- Developed a 2D & 3D simulation in Python for testing path planning & task assignment algorithms for autonomous drone swarms.
- Reduced mapping coverage time by 45% by using transformers & Sequence-to-Sequence model as policy networks.
- Compared Wavefront & PotentialField method to perform safe motion planning and obstacle avoidance in 2D & 3D.
- Proposed a method to adaptively change velocity of drones to perform safe and efficient path planning.
- Improved the accuracy of object recognition models for drone swarms by 8% by sharing sparsely encoded multi-view information.

### *Machine Learning Researcher*, Indian Institute of Technology Madras

Aug. 2018 - May 2019

- Primary designer & developer for building a deep learning pipeline to convert Indian Sign Language videos to words.
- Created a large scale Indian Sign Language dataset of high resolution videos.
- Built a pipeline that uses pose estimation model, CNN video feature encoders and bidirectional LSTMs to classify signs.
- Achieved state-of-the-art accuracy of 92.1% on the American Sign Language (ASLLVD) dataset for the architecture.
- Increased throughput of the model by 15% through model compression techniques including post-training quantization & pruning.

### *Research Intern*, Indian Institute of Technology Bombay

Dec. 2017 - July 2018

- Developed an interactive OCR framework for low-resource languages including Sanskrit, Hindi & Gujarati.
- Built a cross-platform GUI desktop application in C++ language using Qt Creator that converts documents into editable format.
- Reduced OCR conversion errors by 5% by using LSTMs, n-gram based edit distance methods & updating LSTMs on the fly.

## PUBLICATIONS

- INCLUDE: A Large Scale Dataset for Indian Sign Language Recognition *ACM Multimedia (MM'20)*
- Comparative Analysis of Agent-Oriented Task Assignment and Path Planning Algorithms Applied to Drone Swarms *Arxiv*

## PROJECTS

### Adversarial Training to Improve Robustness of BERT

Code: <https://bit.ly/34w0Lt2>

- Created adversarial examples for the sentiment classification task by perturbing the input words based on attention.
- Reduced training time from 12 hrs to 3 hrs by utilizing distributed data parallelism.
- Improved adversarial accuracy from 13% to 66% on selected GLUE & SuperGLUE tasks by performing adversarial pre-training.

### SimpleGAN: A python library to ease training of generative models

Code: <https://bit.ly/3e5Y6JN>

- Primary designer & developer for SimpleGAN, a framework built that aims to facilitate the training of Autoencoders & GANs.
- Performed A/B testing to identify the optimal UX/UI design of the API.
- The open-source project achieved over 6000 downloads and is featured in Hacktoberfest of MadewithML.

### Housing Price Prediction in NYC Boroughs

- Performed feature selection for housing price prediction by performing Data Wrangling & Exploratory Data Analysis.
- Reduced processing time for data pipelines by 1.5 times using Dask & PySpark.
- Created a dashboard for visualization of the features that influence the price of a house for each zipcode in NYC boroughs.
- Built Linear Regression, Decision Tree & Ensemble models to accurately predict the price of a house in NYC boroughs.

### Building Energy Consumption Prediction

- Utilized building meta-data and weather data to predict a building's water, electricity and gas meter readings.
- Performed data cleaning and exploratory data analysis to identify outliers, impute missing data and identify correlations in data.
- Improved model predictive power by performing feature engineering and trained a LightGBM model evaluated with cross-validation.