

# Mukesh Bangalore Renuka

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## EDUCATION

### Columbia University

*Master of Science in Computer Science*

Courses : Artificial Intelligence, Computer Vision, Databases, Natural Language Processing.

Graduate Teaching Assistant: Natural Language Processing

New York, NY

Aug 2021 - Dec 2022

GPA: 4.0/4.0

### National Institute of Technology Karnataka

*Bachelor of Technology in Information Technology*

Courses : Operating Systems, Linear Algebra, Software Engineering, Machine Learning.

Surathkal, IN

Jul 2017 - Jun 2021

GPA: 9.48/10.00 (Top 5%)

## RESEARCH EXPERIENCE

### Massachusetts Institute of Technology - Harvard University

*Research Intern at Lichtman Lab and MIT CSAIL*

Cambridge, MA

Apr 2020 - Nov 2020

- Collaborated with 3 neuroscientists to devise a Tensorflow based deep learning tool to help segment Electron Microscopy images of the brain. Attained a Dice Coefficient of 0.93 for membrane detection and 0.91 for skeletonization on the SNEMI3D dataset.

### Indian Institute of Science

*Research Intern at Spectrum Lab*

Bangalore, IN

May 2019 - Jul 2019

- Developed a Deep Learning based network (VGG+RED-Net) utilizing Tensorflow to analyze retinal fundus images to grade the severity of Diabetic Retinopathy. The network beat the state of the art in detecting Referable DR with an AUC score of 0.978.

## PROFESSIONAL EXPERIENCE

### Siemens Technologies and Services

*Research Intern*

Bangalore, IN

Aug 2020 - Mar 2021

- Leveraged the statistical machine learning based algorithm (PySINDy) to simulate self evolving systems such as chemical mixers with an error of 0.002 while predicting the system pH. Constructed an interactive flask based web app to demonstrate its uses.
- Designed an alternative approach to SIR modeling of COVID-19. The algorithm was able to accurately anticipate the second wave of the epidemic in India by studying the increase in the number of cases.

### Goldman Sachs

*Summer Analyst, Consumer and Investment Management Division*

Bangalore, IN

May 2020 - Jun 2020

- Deployed a distributed caching system to cache in-process data with a speedup of 19-20x against retrieving data from the database.
- Orchestrated a two step fallback mechanism to ensure eventual consistency by leveraging Kafka to increase resiliency.

## PROJECTS

### Hurricane Warning System

- Won second place at Microsoft CodeFunDo++ by developing an android app to assess real-time hurricane data and predict its path.

### Skin Lesion Detection

- Built a containerised web app with the help of Node Js and Docker with a Tensorflow based Neural Network backend to detect Skin Lesions. Achieved an accuracy of 89% with a NASnet based classification network on the ISIC dataset.

### Heuristic solution to TSP using Genetic Algorithms on GPUs

- Conceived an approach to speedup the estimation of a solution to the Travelling Salesman Problem by parallelizing Genetic Algorithms on a GPU using CUDA. Attained 32x speedup against serialised Genetic Algorithms run on CPU.

### Voice Driven Searchable Photos

- Designed an asynchronous event-driven web app to query photos through text and voice with the help of AWS.
- Employed Rekognition and Open Search to create an intelligent search layer to query photos for people, landmarks, objects, etc.

### Decentralised Platform for Collaborative AI using Blockchain

- Created a decentralised platform using Ethereum to provide a framework for users to collaborate on curating large datasets required for AI. Defined smart contracts and a new consensus mechanism to promote collaboration on the platform.

## PUBLICATIONS

- AuthNet: A Deep Learning Based Authentication Mechanism: AAAI 2021 Student Abstract.
- Deep Learning based detection of Diabetic Retinopathy from Inexpensive fundus imaging: CONECCT 2021 - Track Best Paper.
- Clustering Enhanced Autoencoders for Dimensionality Reduction and encryption: FICTA 2021.

## SKILLS

- Python, C++, Java, SQL, MongoDB, Tensorflow, PyTorch, OpenCV, Django, Flask, NodeJs, GCP, AWS, Kubernetes.