# Mahmud Hasan

Raleigh, NC-27606 | Tel: 919-986-2861 | mail: mhasan3@ncsu.edu | LinkedIn: linkedin.com/in/mhasan3 | GitHub: github.com/nombreinvicto

Certified Data Analyst & PhD candidate in Industrial Engineering. 3+ years of applied data science, machine learning, deep learning, computer vision experience.

## EDUCATION

**North Carolina State University, Raleigh, NC.**

**PhD** (ongoing), Industrial Engineering. GPA: 4.00/4.00. Aug 16 – Dec 20
Minor with Statistics Concentration. GPA: 4.00/4.00.
**MS**, Mechanical Engineering. GPA: 4.00/4.00. Aug 14 – May 16

**Bangladesh University of Engg. and Tech.**

**BS**, Mechanical Engineering. GPA: 3.63/4.00. Jan 08 – Dec 13

## RELEVANT COURSEWORK

- Experimental Statistics for Engineers I (Probability, Distributions, Regression & Hypothesis Testing).
- Experimental Statistics for Engineers II (Statistical Learning and Design of Experiments).
- Applied Multivariate and Longitudinal Data Analysis.
- Operations Research and Non-linear optimization.
- Applied Time Series.
- Neural Networks and Deep Learning.

## PROFESSIONAL CERTIFICATIONS

- TensorFlow Developer Professional Certificate, Coursera. Aug 20
- Deep Learning Summer Bootcamp, NCSU Dept. of Electrical & Computer Engineering. Aug 20
- Unsupervised Machine Learning Summer Bootcamp, NCSU Dept. of Electrical & Computer Engineering. July 20
- Natural Language Processing Specialization, Coursera. July 20
- Deep Learning Specialization, Coursera. Feb 20
- Computer Vision - 1, OpenCV. Mar 20
- Intro to Machine Learning Nanodegree, Udacity. Aug 19
- Data Analyst Nanodegree, Udacity. Aug 20

## TECHNICAL SKILLS

- **Languages**: Python, JavaScript, R, Go, Solidity, LabVIEW, MATLAB.
- **Data Science**: Scikitlearn, Numpy, Pandas, Scipy, Statsmodels, Matplotlib, Seaborn, Plotlyjs.
- **Deep Learning**: Keras/TensorFlow, Pytorch, OpenCV.
- **Databases**: MongoDB, PostgreSQL.
- **Frameworks**: NodeJS, ExpressJS, Flask, REST-API.

## SELECTED RESEARCH PROJECTS

**Deep Learning & Computer Vision** **Aug 19 – Present**

- Designed **Generative Adversarial Networks (GANs)** based deep neural architectures conditioned on class labels to generate synthetic images of manufacturing parts that closely capture user intent.
- Implemented fine-tuning of pretrained **LeNet, VGG16, ResNet** & **Densenet121** based **Convoluted Neural Network (CNN)** architectures to predict human cell morphology with **99% accuracy** from lab culture images.
- Designed backend servers & front-end web apps with **computer-vision** pipelines that allow real-time detection of cells from microscope video feeds **using trained CNN models** for the NC State Biofabrication lab. Research featured on NCSU College of Veterinary Medicine. [Link]

**Natural Language Processing (NLP)** **May 19 – Dec 19**

- Designed **LSTM/GRU** based **NLP** models for predicting manufacturing product data types from web-scraped product data descriptions.
- Implemented **LSTM/GRU** based deep neural architectures with pretrained word embeddings (**Word2Vec, GloVe**) for sentiment analysis of twitter feeds, word level language modelling and text generation.

**Machine Learning** **Jan 19 – May 19**

- Designed SMS spam filters using **Naïve Bayes** algorithm with **93% accuracy** on dataset from Grumbletext – a UK based spam SMS silo. Designed **Logistic Regression, SVM, Random Forest** and **Ensemble Methods** based predictive models for loan defaulter classification of banks.
- Implemented unsupervised algorithms (**KMeans, DBScan & Gaussian Mixture Models**) and dimensionality reduction tools like **PCA, t-SNE** to identify segments of the population that form the core customer base for a mail order company in Germany.

## PROFESSIONAL EXPERIENCE

**Data Science Software Engineering Intern,** FlexGen Power Systems, Durham, NC. **May 20 – Aug 20**

- Implemented **statistical modelling** & **machine learning** for prediction analytics of time series data of grid-connected battery devices in Seeq®.
- Contributed to the design and implementation of device telemetry & data acquisition software for grid-connected Energy Storage Systems.

**Data Analyst Intern**, Avery Dennison Corporation, Dhaka, Bangladesh. **May 12 – Aug 12**

- Performed data extraction and analysis tasks for **predictive maintenance** of RFID tag machines using **Python and LabVIEW** for data extraction. Reduced maintenance bottleneck by **30%** through the implementation of real time monitoring devices encoded in Python.

## RESEARCH & TEACHING EXPERIENCE

**Graduate Research Assistant,** NCSU Data Intensive Manufacturing Lab, Raleigh, NC. **Aug 17 – Present**

- Implemented **deep learning** models to make predictions on **IoT enabled CNC** machine downtimes and reduced system bottlenecks by **20%**.
- Designed **Ethereum-blockchain** cloud-manufacturing infrastructures with configurable digital assets & autonomous contract negotiations that improved manufacturing supply chain gridlocks by more than 30%.

**Graduate Teaching Assistant,** NCSU Dept. of Industrial & Systems Engineering, Raleigh, NC. **Aug 16 – Present**

- Mentored **60+ students** in courses of **digital manufacturing**. Guest lecturer of **graduate level Python programming** for applied data science.

## RELEVANT PUBLICATIONS

- **Hasan, M.,** Shohan, S. (2020). Cloud Based Cell Type Detection Platform Using Architectural **Fine Tuning of Deep Neural Nets**. First Annual Centennial Biomedical Campus Trainee & Staff Research Competition. NC State University.
- **Hasan, M**., Starly, B. (2020). Decentralized Cloud Manufacturing-as-a-Service (CMaaS) Platform Architecture with Configurable Digital Assets. Journal of Manufacturing Systems.