GEETIKA SINGH

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OBJECTIVE

Use my knowledge pertaining to data science and device designing in the healthcare industry to innovate and contribute to human welfare.

EDUCATION

Duke University – Pratt School of Engineering, Durham, US *(2021)*
Masters of Science in Bioengineering & Biomedical Engineering, CGPA- 3.84/4

University of Mumbai – D.J. Sanghvi College of Engineering, Mumbai, IN *(2017)*
Bachelors of Engineering in Biomedical Engineering, CGPA- 8.31/10 (Agg.)

TECHNICAL SKILLS

• **Programming Languages**: R (dplyr, tidyverse, e1071, caTools, ggplot2), Python (NumPy, Pandas, Scikit-Learn, SciPy, Keras, TensorFlow, Seaborn, Matplotlib, plotly, datetime, missingno, plotly, pytz, json, os, sys, rowingdata, mne, re, sqlite3), MySQL, C

• **Software:** Git, RStudio, MATLAB, MongoDB, NetLOGO, Tableau, Basics of HL7 & DICOM, Jupyter, Anaconda

• **Data Science & Software Skills:** Machine Learning using Python and R, Analysis using TensorFlow, Computer Vision, Statistical Data Analysis, Time-series analysis, Survival Analysis, ANOVA, Hypothesis Testing, ARIMA, Supervised and Unsupervised Learning, Software dev. & Unit testing, Agent Based Modeling

• **Design Software:** AUTOCAD, Fusion 360, Eagle, KiCad, Proteus Professional, Keil μvision

• **Designing Skills:** Design thinking principles, brainstorming & prototyping, hardware design: mechanical & electrical design and simulation, FMEA, Root cause analysis, 3D printing

HONORS/ AWARDS

• People's Choice Award, BME Design Symposium, Duke University *(2020)*

ADDITIONAL TRAININGS

• Statistical Techniques for Business Forecasting at Indian Statistical Institute, India *(Dec 2017)*
• PLC, SCADA & AC/DC Drives at Siemens India Ltd *(Jun 2016)*

WORK EXPERIENCE

Graduate Research Assistant, Big Ideas Lab, Duke University *Jan '20 – Present*
• COVID-19 ICU patient physiological dataset analysis.
• Build pre-processing functions for the Digital Biomarker Pipeline Discovery module.
• Assess the acceptability of wearable devices data sharing through surveys by designing the survey study.
• Wrote grants and Institutional Review Board (IRB) applications.

Biomedical Data Scientist (Part-time), PAL Inc. (Gaia wearables) *Jan '21*
• Building Machine Learning (ML) models to classify patients based on behaviors using health care data. Predicting meltdowns in patients with autism.

Data Science Intern, Data+ Program, Duke University *May '20 – July '20*
• Worked in a team to complete project 'Prediction of Blindness in Glaucoma patients'. The project was successfully completed as a remote intern.

Student Lab Asst., Dept. of Mol. Genetics & Microbiology *Mar '20 – May '20*
• Analyzed time-series signals from weight and radar sensors using Python libraries.

Teaching Assistant, Duke University *Jan '21*
• Conduct labs & assist in projects for BME 460 – Devices for People with Disabilities

Teaching Assistant, Duke University *Aug '20 – Nov '20*
• Assist students during lectures and lab for BME 474DL - Medical Device Design

Product Developer-Toppr Technologies Pvt Ltd, Mumbai, IN *Aug '17–Nov '18*
• Developed product and designed online content (videos, stories, test series) in collaboration with a team to make learning simple and accessible. Managed freelancers throughout on-boarding, task allocation, review and payments.

Grader, Duke University *Sep '19- May '20*
• Grader for Biomedical Optics (BME 590-08 : Fall '19), (BME 590-06 : Spring '20)

DATA SCIENCE & SOFTWARE PROJECTS

COVID-19 ICU patient physiological dataset analysis, Big Ideas Lab *Present*
• Used data collected from patients in the ICU (using PhysioFlow and Inbody wearable devices) to understand metabolic profile of COVID patients.
• Determine effect of COVID on muscle physiology and body composition.

Prediction of Blindness in Glaucoma patients *Present*
• Used data collected from Electronic Health Records (EHR/ EMR) (in PACE environment) and Durham Neighborhood Compass for the project.
• Built multi-variate statistical model, random forest, support vector machine models to predict blindness and performed survival analysis to study progression (using R).

Pre-processing pipeline for DBDP, Big Ideas Lab *Present*
• Built pre-processing functions for Digital Biomarker Pipeline Discovery (DBDP) to obtain .csv files for data from wearable sensors used in research and/or by people to monitor fitness. These devices were shortlisted by literature review.
• Pipeline outputs .csv format file with processed column names, timestamps, etc.

Detect the Center of Mass of the Left Ventricle as a function of time *2020*
• Detecting the center of mass using Echocardiogram images in MATLAB.

Fetal Head Circumference Measurement using Ultrasound images *2020*
• Used UNet Segmentation algorithm and Convolutional Neural Network for segmentation and fetal head measurement respectively in TensorFlow.

Software Design: Heart Rate Sentinel Server *2020*
• Built a centralized heart rate sentinel server with GUI that receives API requests from patient heart rate monitors in Python. Server sends email to the physician if tachycardic heart rate occurs.

Quantitative Pathophysiology projects *2020*
• Built a NETLOGO models to show role of the immune system in AIDS, windkessel model and Luo Rudy model. Explored heart dysfunction during heart attack.
• Developed model of a myelinated fiber connected to a muscle fiber and further developed the model for Chronic Inflammatory Demyelinating Polyneuropathy.