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 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.

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

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

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.

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

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.

K-sense Gait and Knee Flexion Monitoring Device *2020*
- Designed a device to provide feedback to children with disrupted gait cycles.
- Included a sound alert that alerts the client when child performs correct gait pattern. This ensures positive feedback.

Portable Musculoskeletal Support and Stimulation Device *2017*
- Developed a portable device that automatically adjusts the height of the crutches on stairs and provides support while sitting and ascending and descending stairs.
- Design includes a Muscle Stimulator for reduction of muscular pain.

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.