# Bobby Mohan

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Bioengineering Graduate with 7+years of Industry and Research experience. Having practical knowledge in Machine Learning, NLP, and DSP. Currently looking for Full-time jobs and will be ready to begin on **January 16, 2023**.

## EDUCATION

**M.S. Neural Engineering (GPA: 3.6)** **Dec 2022**
- University of Pittsburgh, Pittsburgh, PA

**M.E Biomedical Engineering (GPA: 3.4)** **May 2015**
- Anna University, India

**B.E Electrical and Electronics Engineering (GPA: 3.5)** **May 2013**
- Anna University, India

## WORK EXPERIENCE

**Research Experience**

Carnegie Mellon University, PA, USA
- Visualization and comparison of high dimensional neural activity using PCA, PPCA, and FA.
- Estimating ML parameters for Gaussian and naïve Bayes models to classify neural data.
- K-Means elbow method was used to cluster neurons, and convergence to a local minimum was examined.
- Performed Model selection in the feature space for clustering high dimensional spike waveforms which is down to two-dimensional feature space using PCA.

The University of Pittsburgh, PA, USA
- Identification of EEG seizure activity in small time segments using unsupervised TSNE and K-Means.
- Implement ICA to retain higher order statistics in EEG signal for linear analysis of eye movements.
- Classification of the DermaMNIST database using an unsupervised Non-Negative Factorization (NMF).
- Performing spectral analysis on local field potential signals, recorded from superior colliculus to understand the transformation of sensation to action during visually guided movements.

**Research Associate** **Jan 2020 - Jan 2022**

Cluster Training and Computational Services, India
- Fetal ECG signals were extracted using the supervised Support Vector Machines (SVM) model.
- Segmentation of Human Knee Joint deploying LCM segmentation method for OA assessment.
- Developed an Automated popping helmet with head movement analysis using IMU.

**Assistant Professor** **June 2015 - Sept 2020**

Rajalakshmi Engineering College, Anna University, India
- Handled courses, including Digital Signal Processing, Biomechanics, and Circuits.
- Developed a python program for the recognition of handwritten digits using 2D-CNN which worked with an efficiency of about 90%.

## KAGGLE CHALLENGES

**Frame-Level Speech Recognition:** Created a multilayer perceptron for a frame-level phonetic transcription of raw MFCCs. To discriminate between each phoneme class label, the cross-entropy loss was used to minimize the dissimilarity between output logits and the target labels.

**Face Classification & Detection:** Implemented three deep neural networks, ConvNext, ResNet34 and Resnet50 for face image classification and recognition, which worked with a classification accuracy of 90% and a verification with 70%.

**Automatic Speech recognition:** The speech vectors are transcribed to phonemes using the LSTM deep network, and a Levenshtein distance of less than 6 is achieved.

## TECHNICAL SKILLS

- Python Libraries - Numpy, Pytorch, Tensor Flow, Matplotlib, Jupyter, Keras
- Languages - C, C++
- MATLAB Libraries - Signal Processing, Neural Networks, CSDPlotter, Image Processing
- Cloud Platform - AWS, Google collab, JAX, TPU
- Version Controlling - GitHub
- Others - R-Lab, COMSOL, Ansys, EAGLE

## RESEARCH

**Vascular parameters measuring device- *Patent Applied*** **Aug 2019**
- Non-invasive device is fabricated to measure continuous vascular parameters of the user.

**Sensors for detecting renal disorder patients, *Sensor Letter*** **May 2016**
- The breath signal recorded using MOS sensors is processed for identifying renal disorder patients.

**Classification for renal dysfunction patients using SVM, *JMBE*** **June 2015**
- Utilizing steady-state response, pre-and post-dialysis groups were classified.

**Canvas: Implementing Methodology and Performance Analysis** **Sept 2022**
- Regression analysis is performed for identifying AC, and SI with the known blood pressure values.