

Deep Soni

dsoni5@jhu.edu | [Portfolio](#) | [LinkedIn](#) | 443-868-5690

EDUCATION

Johns Hopkins University, Baltimore, MD

Expected Grad: May 2021

MSE in Biomedical Engineering

Courses: Machine Learning, Deep Learning, Data Science

Course Assistant: Biomedical Data Science

Indian Institute of Technology (BHU) Varanasi

Aug 2014 – May 2019

Dual Degree - B.Tech.(Honors) in Bioengineering and M.Tech. in Biomedical Technology

Courses: Artificial Intelligence, Signal and Image Processing

Central Sector Scholarship

WORK EXPERIENCE

Center for Data Science in Emergency Medicine, Johns Hopkins Medicine & University

Feb 2021 – Present

Data Science Intern

- Cleaned and normalized Electronic Health Record (EHR) data from 5 Emergency Departments.
- Collaborated with ED clinicians to extract features from EHR data to predict Acute Kidney Injury (AKI).
- Deploying a Random Forest model to identify patients with high risk of AKI within 1.7 hours from arrival.
- Involved in end-to-end development of a Machine Learning based AKI Clinical Decision Support tool.

RESEARCH EXPERIENCE

Seizure induced brain activities in Glut1-DS patients using simultaneous EEG-fMRI

Aug 2020 – Present

Graduate Research Assistant, Dept. of Radiology, Johns Hopkins School of Medicine

- Applied Generalized Linear Model on EEG and fMRI signals to investigate underlying regional seizure activity pattern and generate brain activation/deactivation maps showing 1.3% mean signal change.
- Identified functional connectivity brain networks most affected by seizure through Independent Component Analysis (ICA) and connectivity correlation matrices.

Brain Computer Interface (BCI) using Machine Learning for wheelchair control

Jul 2017 – May 2019

Graduate Research Assistant, Indian Institute of Technology (BHU) Varanasi

- Designed EEG-based BCI system to control wheelchair motion with 91 bits/min Information Transfer Rate.
- Devised a novel algorithm for online feature extraction of SSVEP EEG signals using Canonical Correlation Analysis and Support Vector Machines to identify user's command with 93% Accuracy and 99% Precision.

PROJECTS

Decoding Auditory Attention from EEG Data Using Deep Learning | Python, CNN

- Implemented a Convolutional Neural Network to recreate audio signals from EEG data and estimate attention of listener in multi-speaker environment with 65% accuracy.

pyAutomagic : EEG preprocessing package | Python, Git, MATLAB

- Led a team of 6 students to develop a python-based [package](#) for preprocessing EEG data.
- Developed python scripts to read structured EEG data, employ user-requested preprocessing algorithms, write results in BIDS format and notebooks to demonstrate usage of the package.

Data Analysis dashboards | R, shiny, flexdashboard, Random Forest

- Built and deployed a real-time live [dashboard](#) to visualize the spread of COVID-19 in the world.
- Designed a [dashboard](#) to review trends in healthcare costs in USA and predict costs using Random Forest.

SKILLS

Programming Languages: Python, MATLAB, R, SQL

Packages and Softwares: Keras, PyTorch, sklearn, pandas, Simulink, COMSOL Multiphysics

Engineering: Machine Learning, Data Science, Deep Learning, Signal Processing, Neuroengineering

PUBLICATIONS

Deep Soni, Nitesh Singh Malan, and Shiru Sharma. "CCA Model with Training Approach to Improve Recognition Rate of SSVEP in Real Time." Proceedings of the 2019 3rd International Conference on Artificial Intelligence and Virtual Reality. 2019. DOI: <https://doi.org/10.1145/3348488.3348498>

LEADERSHIP

- Led a group of 5 to 1st position in Startup Weekend Varanasi 2014.
- Elected as Student Representative for Departmental Under-Graduate Committee, IIT(BHU).