Suvadeep Maiti

M.S by Research in Electronics Engineering
Brain, Cognition and Computation Lab
IIIT, Hyderabad

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Education

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
M.S. in ECE	IIIT, Hyderabad	8.83	2021-Present
B.E. in EE	Jadavpur University, Kolkata	8.93	2016-2020
Higher Secondary	CBSE	93.4%	2016
Secondary	WBBSE	95.0%	2014

Research Experience

- **Automated sleep stage and sleep apnea detection** *Sept 2022 - ongoing*
  Prof. Bapi Raju S., Cognitive Science Lab, IIIT Hyderabad
  – Working on sleep stage classification and sleep apnea detecton using deep learning models on polysomnography dataset collected from stroke patients
  – validation of PPG, BCG against PSG, and short-term cognitive outcome of Sleep in Ischemic Stroke Patients

- **Developing a framework for performing laminar inference using magnetoencephalography (MEG)** *May 2023 - ongoing*
  Prof. James Bonuaito., DANC Lab, ISC Marc Jeannerod, CNRS
  – Simulated brain MEG dataset containing 11 equidistant layers between the white matter and pial surfaces for signal localization using backward algorithms
  – Analysed the generated data using current source density (CSD) transform, revealing temporally dynamic current sources and sinks, and a relative power analysis

- **Hierarchical representations of bird vocalizations in the avian auditory cortex** *Dec 2021 - April 2022*
  Prof. Joby Joseph.,Neuronal Circuits Lab, University of Hyderabad
  – Worked on crcns data-set of neuronal recordings in auditory cortex of anesthetized zebra finches listening to vocalizations used by the species.
  – Our study investigates dynamics of neural activity of the auditory cortex in the avian brain

- **Modelling of oscillations in grasshopper optic lobe neurons** *Aug 2021 - Nov 2021*
  Prof. Joby Joseph.,Neuronal Circuits Lab, University of Hyderabad
  – In vivo electrophysiological field potential recorded from grasshopper optic lobe neurons
  – modelling the oscillations found in grasshopper optic lobe neurons

- **Implementation of Wilson-Cowan model to investigate Working Memory** *Aug 2021 - Nov 2021*
  Prof. Bapi Raju S.,Prof. Bapi Raju S., Cognitive Science Lab, IIIT Hyderabad
  – Implemented Wilson-Cowan model to describe dynamics of interactions between populations of simple excitatory and inhibitory model neurons

- **Road extraction using K-means cluster** *Aug 2021 - Nov 2021*
  Prof. Ravi Kiran S., CVIT Lab, IIIT Hyderabad
  – Implemented K-means algorithm and used on satellite images to separate roads from other objects
  – Used different morphological operations to extract the road segment and compared the output with reference image

- **Implemetation of LENET-5 architecture from scratch use it to get Brain-Score** *March 2022 - Apr 2022*
  Prof. Bapi Raju S, Cognitive Science Lab, IIIT Hyderabad
  – Developed 7 layered LENET-5 architecture
  – Compared its performance and results on MNSIT data set and get Brain-Score

- **Toward improved control of prosthetic fingers using electrocardiogram (EMG) signals** *Sept 2019- Aug.2020*
  Prof. Amitava Chatterjee, Department of EE, Jadavpur University
  – discrimination between finger movements using surface EMG signals so that different finger poses of a prosthetic hand can be controlled in response.
  – trained and tested using the available offline raw data using PCA, ANN, LDA

Summer Schools

National Centre for Biological Science, Bangalore *Jul 2022 - Aug 2022*
Computational Approaches to Memory and Plasticity
- Trained in theoretical and computational modeling, pertaining to memory and plasticity in the brain, spanning different scales of space, time and complexity.

Neuromatch Academy *Aug 2022*
Computational Neuroscience
- Neuromatch Academy covers topics in computational methods including modeling, machine learning, dynamical systems, and stochastic processes.

Technical Skills

- **Programming**: C, Python, MATLAB
- **Softwares and Libraries**: Pytorch, Pytorch-lightning Tensorflow, scikit-learn, numpy, pandas, Matplotlib, NEURON, Brian2, Linux
- **Tools**: Google Colab, Jupyter Notebook, Git
- **ML & DL Concepts**: Classification and Regression: KNN, RNN, Logistic regression, SVM, Naive Bayes, Linear regression; Deep Learning: CNN, LSTM, Transformer

Key courses taken

- **Mathematics**: Linear Algebra & Optimization, Probability
- **Neuroscience**: Introduction to Neural and Cognitive Modelling, Introduction to Cognitive Science, Cognitive Neuroscience, Cognitive Science and AI
- **Machine Learning**: Introduction to Machine Learning, Advanced Topics in Machine Learning, Statistical Methods in Artificial Intelligence
- **Signal Processing**: Digital Image Processing

Position of Responsibility

- **Teaching Assistant**: Neural and Cognitive Modelling
- **Teaching Assistant**: Cognitive Neuroscience
- **Teaching Assistant**: Cognitive Science & AI

Achievements

- **Rank 5**: Among all the 2016-20 batch B.Tech students of the EE department, Jadavpur University 2020
- **2nd**: *Decisia 2018*, an event of *Convolution*, Electrical Engg. Dept., Jadavpur University, Kolkata 2018