MRITTIKA DEY

mrittika-dey mrittika-dey mrittika.dey@uclouvain.be
mrittika-dey MrittikaDey2

EDUCATION

National Brain Research Center, India *Oct 2020 - July 2022*
Master of Science (M.Sc.) in Neuroscience
Final aggregate: 86.68%
Total credits: 120 ECTS

Lady Brabourne College, India *July 2017 - Oct 2020*
Bachelor of Science (B.Sc.) in Microbiology
Final aggregate : 76.25%
Total credits: 180 ECTS

RESEARCH EXPERIENCE

Human Vision Lab *Oct 2022 - Present*
Université catholique de Louvain, Belgium
Designation: Research Assistant
Project Supervisor : Prof. Valérie Goffaux
Project : Testing behavioral implications of coarse-to-fine masking during face processing.

Cognitive Brain Dynamics Lab *Aug 2021 - July 2022*
National Brain Research Center, India
Designation: M.Sc. dissertation student
Project Supervisor : Dr Dipanjan Roy
Project : Characterising age related dynamical changes in coherence, phase, and power between transient resting state networks in the brain.

PROJECTS

Cognitive Brain Dynamics Lab *Aug 2021 - July 2022*
National Brain Research Center, India
Project Supervisor : Dr Dipanjan Roy

- Analysing MEG data from a large cross sectional dataset to identify age-related shifts in phase dynamics of transient resting state brain networks in healthy aging. Statistical Bayesian modeling is used to characterise transient brain states which show varied network dynamics with both frequency and age. We also wanted to explore whether these states follow a specific gradient of shift in spectral properties with age and whether this phenomenon can be captured in a millisecond timescale (100-200ms).
  Links: Thesis, Slides, Codes

Computational Neuroscience project *March 2021*
National Brain Research Center, India
Project Supervisor : Dr Arpan Banerjee

- Replicated the results of the paper 'Biophysical Basis for Three Distinct Dynamical Mechanisms of Action Potential Initiation', Prescott et al., 2008 for Computational Neuroscience coursework project.
  Links: Report, Slides, GitHub repository

SKILLS

Programming:	MATLAB, Python, LaTeX
Computational Neuroscience:	Psychophysics, EEG recording and analysis, MEG analysis, Stimulus design
Software & Tools:	Psychopy, FSL, EEGLAB, Fieldtrip, SPM, NBS Presentation, Freesurfer, HCP workbench

WORKSHOPS

Computational Approaches to Memory and Plasticity *Aug 2022*
Projects:

- Reducing the 4-dimensional Hodgekin Huxley neuron model to a simpler 2D model resembling the Fitzhugh Nagumo neuron model using a recurrent neural network.
  Links: Certificate, Slides, Codes
- Replicating the paper "Accurate Path Integration in Continuous Attractor Network Models of Grid Cells". We generated grid cell patterns by using inhibitory point neurons arranged in a disc around each neuron. The extent of inhibition of each neuron was designed to have a Mexican-hat like shape and an overall excitation was supplied to the system. This continous attractor model was successful in replicating the grid cell population patterns as well as trajectories. We also calculated how the gridness scores change with change in parameter values.
  Links: Certificate, Original paper, Slides, Codes

Neuromatch Academy *July 2022 - Aug 2022*
Projects:

- Investigating effective connectivity between brain regions from the HCP fMRI dataset when subjects performed an emotion processing task. We were interested in understanding the relationship between visual and emotion processing regions of the brain when a participant perceived a fearful face v/s a neutral face as compared to the brain activity when a participant was shown different shapes as a stimuli.
  Links: Slides

COURSES

Neuroscience:	Cognitive Neuroscience, Computational Neuroscience, Systems Neuroscience, Cell and Molecular Neuroscience, Developmental Neurobiology, Neuroanatomy, Membrane Biophysics, Neurochemistry, Neuroimaging
MOOCs :	NPTEL course on Machine Intelligence and Brain Research (conducted by the Indian Institute of Technology, Madras), MATLAB ONRAMP courses on Machine Learning, Signal Processing, Image Processing and Deep Learning

ACADEMIC ACHIEVEMENTS

- Ranked 2^{nd} in class during coursework at National Brain Research Center.