Himanshu Aggarwal *August 30, 1997*

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Education

Indian Institute of Science Education and Research (IISER) Mohali   Punjab, India

Bachelors & Masters of Science (Mathematical Biology), Dual Degree   *2015 – 2020*
Thesis: Statistical modeling and analyses of epidemiological data of malaria in India
- Performance index during thesis year: **10/10**
- Cumulative performance index: **8.4/10**

M.G.N. Public School, Adarsh Nagar, Jalandhar   Punjab, India

Higher Secondary School   *2013 – 2015*
Scored 96% in final exams – among the 1% of highest scoring students all over India.

Skills

Programming: Python, MATLAB, C, JavaScript, R, LaTeX

Experiment Design: Psychopy, expyriment, Psychtoolbox, Presentation

Neuroimaging and Preprocessing: 3T MRI acquisition, nilearn, FSL, SPM, MNE

Machine Learning and Statistics: scikit-learn, numpy, scipy, pandas

Spoken Languages: English, Hindi, Punjabi (*fluent*), French (*beginner*).

Research Experience

Team MIND (ex-Parietal) INRIA Saclay / Neurospin, CEA Saclay   Ile-de-France, France

Research Engineer   *Currently, since Dec 2020*
I am working on the Individual Brain Charting (IBC) project, a part of the Human Brain Project, that aims at repeatedly scanning a cohort of 12 subjects with a large and varied set of functional protocols to provide an objective basis to inform the definition of brain regions. Towards that regard, apart from carrying out the acquisitions, I have been developing a lot of task-based fMRI experiments spanning across several different target cognitive domains (GitHub repo). In addition, I have also been working on preprocessing all kinds of brain MRI data including structural, functional, quantitative as well as diffusion MRI (GitHub repo).

Sinha Lab, IISER Mohali   Punjab, India

Masters' thesis   *Aug 2019 – Aug 2020*
Provided statistical evidence for the shift of malarial incidence distribution towards higher altitides as a consequence of temperature increase (due to global warming) in high-altitude regions of India. In addition, I also used multiple linear regression to explore the dependance of malaria incidence on temperature and rainfall in a highly humid city of India.

Summer Intern   *May 2019 – July 2019*
Explored climatic spatial patterns in India using K-Means and principal component analysis (PCA).

Volunteer   *Jan 2019 – May 2019*
Volunteered to help another masters' thesis student in the lab with decoding analyses of fMRI data. We compared two supervised machine learning algorithms - SVM and LDA using cross-validation for classifying trials when the subjects were viewing colors vs. faces.

Summer Intern   *June 2017 – July 2017*
Coded difference-equation models to simulate host-parasite metapopulation dynamics and differential-equation models to simulate protein molecular dynamics.

Raman Lab, IIT Madras Chennai, India

Summer Intern *May 2018 – July 2018*

Developed a Flask based web-interface for a graph-theoretic algorithm that could identify all possible pathways between given metabolites (GitHub repo). Further added a feature that could perform reaction knock-outs in-silico.

Bhattacharyya Lab, IISER Mohali Punjab, India

Summer Intern *May 2016 – July 2016*

Volunteered in helping with multiple experiments that investigated the trafficking and signaling through metabotropic glutamate receptors (mGluRs) in mice neuronal populations.

Other activities

Neuromatch Academy (2022): Interactive coursework in computational neuroscience and project-work on decoding motor behaviour from ECoG neural activity using nilearn, MNE and scikit-learn (GitHub repo).

Organization for Human Brain Mapping (OHBM) BrainHack 2022: Contributed to nilearn

Society for Mathematical Biology 2020 Annual Meeting: Presented a poster on "Impact of temperature change on Malaria incidence in high altitude regions of India".

Web Development Team, INSOMNIA 2018: Developed website for annual cultural and science festival of IISER Mohali

Web Development Team, Student Representative Council 2016-17, IISER Mohali: Developed and maintained the website for the student body of IISER Mohali

Awards / Achievements

Graduate Aptitude Test 2020: All India Rank 80

INSPIRE Fellow 2015-2020: Received scholarship awarded by Government of India for Innovation in Science Pursuit for Inspired Research (INSPIRE)

IIT Madras Summer Fellow 2018: Received scholarship awarded by Indian Institute of Technology (IIT) Madras for summer research internship

Problem Solving Assessment (PSA) 2013: Scored over 95 percentile in language convention, quantitative and qualitative reasoning of PSA conducted by Govt. of India.

Relevant coursework

Mathematics: Group Theory and Linear Algebra, Real Analysis, Curves and Surfaces, Probability and Statistics

Interdisciplinary Courses: Introduction to Computers (Python), Hands-On Electronics, Network Science, Theoretical Biology, Numerical methods, Nonlinear Dynamics, Chaos and Complex Systems, Machine Learning

MOOCs: Coursera: Fundamental Neuroscience for Neuroimaging and Principles of fMRI 1 & 2, Harvard MOOC: CS50's Introduction to Computer Science, MIT OCW: Single Variable Calculus