Jason Joby

4TH YEAR · BS-MS DUAL DEGREE

Indian Institute of Science Education and Research, Pune

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Education

Indian Institute of Science Education and Research, Pune *Pune*
BS-MS DUAL DEGREE *2019 - present*
- Current CGPA: 8.2 (out of 10)
- Last SGPA: 9.0 (out of 10)

The Mother's International School, Delhi *New Delhi*
INTERMEDIATE DEGREE (CBSE, CLASS 12) *2019*
- Average Marks: 91.6%
- Subjects: Physics, Maths, Chemistry, Computer Science, English

The Mother's International School, Delhi *New Delhi*
MATRICULATION DEGREE (CBSE, CLASS 10) *2017*
- CGPA: 9.6

Research Experience

Semester Project @ IISER Pune *Pune*
SUPERVISORS: DR. COLLINS ASSISI, IISER PUNE *Aug 2022 - Nov 2022*
- Title: Chaos in "Sudoku" Neuronal Networks with Balanced Excitatory and Inhibitory Activity
- The project investigates the route to chaos as transitions between different states/dynamics: (fixed points, limit cycles, transitions between limit cycles) using "Sudoku" networks modelled with **excitation-inhibition balance** following the characteristic networks of Vogels et al., 2011.
- Used Mirollo-Strogatz Coupled Oscillators as the neuron model for a complete tripartite network of inhibitory neurons with **STDP** in the recurrent connections to an excitatory group, to observe transitions between "limit cycles".
  Links: [Poster][Endsemester Report][GitHub Repo][JupyterBook]
- Modelling done in the **brian2** simulator, using Jupyter Notebooks. In continuation of a summer project, from June - July '22, under the supervision of Dr. Assisi.

Neuromatch Interactive Track Student *Int'l Virtual School*
NEUROMATCH ACADEMY *July 2022*
- **Intensive 3-week program** in computational neuroscience involving hands-on tutorials developed and taught by leading experts, as a part of TA-led pods of 10-15 students.
- Online Summer School in Computational Neuroscience. Topics such as Generalized linear models, Bayesian inference, Hidden Markov models, and Short-term plasticity were covered.
- Group project involving analysis of the Allen Institute Visual Behavior 2P dataset to investigate if different subpopulations of cortical interneurons could "encode" novelty. Links: [Group Project: Slides | Colab Notebook]

Semester Project @ IIT Bombay *Virtual*
SUPERVISORS: PROF. ROHIT MANCHANDA, NITIN ANISETTY *Jan 2022 - April 2022*
- **NEURON Modelling Software** Basics
- Reading: Foundations of Cellular Neurophysiology, Johnston and Wu
- Understand how variable time-step integration works (Cvode) and troubleshoot errors

International Genetically Engineered Machines (iGEM) 2021 - Team IISER-Pune-India *Int'l Competition*
PI: PROF. THOMAS PUCADYIL, IISER PUNE *Feb. 2021 - Nov. 2021*
- Project: "Recycling carbon dioxide for bio-manufacturing using a co-culture of cyanobacteria and *E. coli*"
- The team received a gold medal and nominations for Best Manufacturing Project and Best Education.
- As a part of the Dry Lab team, used modelling methods (Flux Balance Analysis) for **genome-scale models**, in MATLAB.
- As a part of the Wiki team, was involved in designing and building the project's website. Links: [Website] [GitHub Repo]

Courses Completed @ IISER Pune

Biology Mathematical and Computational Biology, Neurobiology - I, Animal Behaviour, Data Science, Animal Physiology-I, Animal Physiology - II, Bioinformatics, The Cognitive Basis of Science, Cellular Biophysics I, Developmental Biology, Disease and Discourse, Literature Review, Introductory Immunology, Genetics, Physiology, Cell Biology, Advanced Molecular Biology, Ecology - I, Ecology and Evolution, Introduction to Biomolecules, Practical: Basic Biology, Introductory Biology - I

Maths Graph Theory, Advanced Linear Algebra, Discrete Structures, Real Analysis I, Undergraduate Algebra I, Probability and Statistics, Linear Algebra, Calculus - I, Calculus II

Interdisciplinary Introduction to Computer Programming, Data Analysis, Mathematical Methods for Physics, Thermodynamics

Physics Introductory Electricity and Magnetism, Introductory Quantum Physics, Introductory Mechanics, Physics Lab - I

Chemistry Principles of Inorganic Chemistry, Principles of Physical Chemistry, Principles of Organic Chemistry, General Chemistry Practicals I

Additional Certificates

2022   *Neural Networks and Deep Learning*
DeepLearning.AI via Coursera

2021   *Algorithmic Toolbox*
University of California San Diego via Coursera

2020   *CS50x Puzzle Day 2020*
Harvard University
Solved 8/8 puzzles in a duo team

Technical Proficiencies

Python	Proficient
brian2	Competent
PyTorch	Beginner
NEURON	Beginner
C++	Competent
MATLAB	Beginner
Git/GitHub	Competent
HTML/CSS/JS	Competent
Linux/CLI	Beginner

Extracurricular Activities

Participation in Clubs   *IISER Pune*

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, PUNE   *2019-2021*

- Participation in iPLUG Club and voluntary work (video editing) for the Drama Club
- Wrote a Chrome Browser extension that automatically fills in the "CAPTCHA" for IISER Pune's SAM portal (Academic ERP) login form.

Community Service Programme   *Mother's Int'l School, New Delhi*

THE MOTHER'S INTERNATIONAL SCHOOL - ROHINI GHADIOK FOUNDATION   *2017*

- Teaching a class of junior schoolers English and Maths after-school for a period of 6 months