Atharv Suryawanshi

Bachelor of Science (Research)
Indian Institute of Science
Bengaluru, India

LinkedIn: Atharv Suryawanshi
Email: atharvsagar@iisc.ac.in
Github: AtharvSuryawanshi
Website: atharvsuryawanshi.github.io

Education

Indian Institute of Science — Nov 2021 – Present
BS (Res): Physics Major — *Bengaluru, Karnataka, India*

Chhatrapati Shahu Science Junior College — 2019 - 2021
Final Score: 90% — *Satara, Maharashtra, India*

Jnana Prabodhini Prashala — 2018 - 2019
Final Score: 96.4% — *Pune, Maharashtra, India*

Research Interests

Computational Neuroscience, Machine Learning, Reinforcement Learning, Natural Language Processing, Brain-Computer Interfaces, Neurotechnology

Research Experiences

Bachelor's Thesis — Sept, 2024 – ongoing
Dr. Martin Hebart — *Max Planck Institute for Human Cognitive and Brain Sciences, JLU Germany*

- Title: Extracting hidden neural representations in Human Visual Perception
- Applying dimensionality reduction techniques such as Non Negative Matrix Factorization and k-Means clustering on MEG data to find hidden neural representations of daily objects in the visual processing.

Research Internship — May, 2024 – Aug, 2024
Prof. Arthur Leblois, Prof. Nicolas Rougier — *University of Bordeaux, CNRS*

- Title: Reinforcement learning in dual pathway architecture of Songbird dynamics
- Modelling dual pathway architecture underlying vocal training in song birds using a rate- based model. Developed sleep-inspired algorithms for offline consolidation and performance gains.

Research Internship — May, 2023 – Aug, 2023
Prof. Ashesh Dhawale, Faculty, Centre of Neuroscience — *Indian Institute of Science*

- Project title: Meta Reinforcement learning on a continuous reinforcement learning task
- To understand, learn and implement reinforcement learning algorithms solving multi-armed bandit and continuous action space tasks.
- To design and implement feed-forward, recurrent neural networks solving the reinforcement learning tasks using Pytorch.

Summer Project — July, 2023
Deep Learning - Reinforcement Learning — *Neuromatch Academy*

- Project title: Effect of reward shaping on Lunar Lander learning
- Implemented DDPG, A2C algorithms using stable-baselines and learned to use Gymnasium environment.

Course Project April, 2024

Prof Rishikesh Narayanan, Molecular Biophysics Unit *Indian Institute of Science*

- Topic: Robustness of Basket Cell Network Dynamics to Physiological Noise
- Used NEURON Yale and Python for creation of networks
- Analyzed synchrony and phase locking in intern-neuronal network.

Other Experiences

Authored Conference Report May, 2024

Conference on Neuroscience and Artificial Intelligence *Society of Neuroscience*

- Hosted by the Société des Neurosciences at the University of Bordeaux, this conference gathered top European researchers to explore advances in neuroscience and AI. Authored the official meeting report.

Talk in the institute Sep, 2023

(ACM-W Talk) *Indian Institute of Science*

- Gave a talk on the topic: Algorithms and Neural Networks in Reinforcement Learning
- Introduction to reinforcement learning, multi-armed bandit task, continuous tasks and Neural Network algorithms used to solve Gymnasium environments.

Summer School July, 2023

Deep Learning, Neuromatch Academy

- Code-first, hands-on course in current deep learning techniques using PyTorch library.

Astrae IISc Coordinator Feb, 2023 – Present

(Astrae IISc Instagram Page) *Indian Institute of Science*

- The Astronomy club in IISc
- Organized two large-scale events.
- Cosmogaze: Campus-wide stargazing and comet-watching event C/2022 E3 (ZTF).
- CosmoExpo: An astronomy awareness event for high school students around Bengaluru with talks from renowned professors.

iGEM 2022: Human Practices April – Nov, 2022

iGEM IISc 2022 Team Wiki

Conducted multiple workshops educating students about GMOs around Bengaluru.

Biostatistics Dec 2022

A course conducted by IISER Pune on statistical methods and its usage in biological models.

Teaching Assistant at Quantum Wonder Aug 2020

Quantum Wonder, RAM *Raising A Mathematician Foundation*

- Basic quantum mechanics workshop organised by Raising A Mathematician foundation.
- Presented on Scanning Tunneling Microscopes in the workshop.

Summer School May, 2019

Raising A Mathematician Training Program

- Learning higher level mathematics and statistics.

Awards & Honors

Cleared JEE Mains and Advanced 2021 with top 0.1 per cent nationally 2021

One of the most highly competitive exams in the nation

IISER Aptitude Test All India Rank 8 2021

Competitive exam used to select students into top research institutes across the country

INSPIRE Research Fellow 2021 - 2025

National Talent Search Examination - NTSE Scholar 2019 - 2021
Highly prestigious exam conducted by Govt of India

Qualified for Indian National Astronomy Olympiad 2020

Qualified for Regional Mathematics Olympiad 2019

Skills

Programming Languages

- Python: Beyond Intermediate level including libraries PyTorch, Gymnasium
- MATLAB: Intermediate including Signal Processing ToolBox
- C Programming: Intermediate
- NEURON Modelling: My work
- LaTeX: Intermediate
- Mathematica: Beginner

Data Analysis: Credited a university level Data Analytics course

Management and Leadership: Coordinator of Astronomy club and managed several big public events.

Technical Skills: Image Stacking and Processing, Digital art and video editing
Research Skills: Mathematical Modeling, Problem Solving, Critical thinking, Analysis using Python and other programming language, Research Writing.

Languages: English (professional proficiency), Marathi (native proficiency), Hindi (bilingual proficiency), German (beginner)

Relevant Courses Taken (till Sept 2023)

- Introductory level courses in Physics, Mathematics, Biology, Chemistry, Computer Science, Electronics, Material Science, Environmental Science till 3rd semester
- Theoretical and Computational Neuroscience
- Neuronal Physiology and Plasticity
- Neural Signal Processing
- Data Analytics
- Pattern Recognition and Neural Networks (Audited)
- Computational Physics
- Computational Epidemiology

- Linear Algebra and Analysis 1 and 2
- Probability and Statistics
- Mathematical Methods of Physics
- Introduction to Neuroscience

Extra Curricular Activities

3D combinational puzzles: 7x7 Rubik's Cube, Ghost Cube, Mastermorphix, Mirror Cube, etc.
Dramatics: Participated in multiple plays in college
Astrophotography: Captured, stacked and processed multiple deep sky objects
Music: Guitar (beginner)

Sports

Swimming: State level swimmer, won multiple best swimmer awards in college
Triathlon: Participated and completed 2 intermediate level triathlons
Cycling: Won multiple university awards, cycled 100km in a day
Running: Completed half hill marathon
Ultimate Frisbee Player for the college team
Trekking, Badminton, Athletics