Shaurya Goyal

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Education

École Normale Supérieure (ENS–PSL), Paris   **2024 - Ongoing**
MS in Cognitive Science, Diploma ENS   17.5 / 20
Specialization: Cognitive Modelling, Theoretical Neuroscience and AI

Indian Institute of Technology (IIT), Kharagpur   **2020 - 2023**
BS-MS in Economics   Minors : Mathematics, Computer Science   CGPA: 8.3 / 10
Transferred to ENS-PSL after completing 3 years

Publication and Conference Posters

Cumpelik A., **Goyal S.**, Barayeu U., Csicsvari J. L. ; The role of prefrontal spatial coding in supporting a contextual association task.
Co-Author: FENS Forum, 2024; Society for Neuroscience (SfN), 2023, 2024
Presenter: Junior Scientists Workshop on Recent Advances in Theoretical Neuroscience, 2024

Subbalakshmi, A.R., Sahoo, S., Manjunatha, P., **Goyal, S.**, et al. The ELF3 transcription factor is associated with an epithelial phenotype and represses epithelial-mesenchymal transition. J Biol Eng 17, 17 (2023). https://doi.org/10.1186/s13036-023-00333-z

Research Experience

OFC - M2 Communication during Decision Making   **2025 - Ongoing**
Prof Fanny Cazettes — CNRS France
- Analyzing how OFC-M2 communication affects decision making strategies during foraging

Biologically Plausible Learning in Feedback RNNs   **2025 - Ongoing**
Prof Alex Cayco-Gajic — ENS Paris
- Analyzing various biologically plausible learning rules in a feedback driven recurrent neural network
- Comparing the alignment of weight updates and behavioral dynamics with dimensionality reduction

Role of mPFC and CA1 in Context Association   **2023 – 2024**
Prof Jozsef Csicsvari — IST Austria
- Identified learning stages over days using behavior metrics and clustering
- Analyzed spatial representations over learning using place field metrics, splitter cell criteria, SVMs and PCA
- Investigated contextual coding in hippocampal replay using Bayesian Decoding and regression

Hippocampal Cell Dynamics During Replay   **2022 – 2023**
Prof Dan Bendor — University College London (UCL)   Remote
- Developed a novel Bayesian Decoding method to track spatial representations in SWRs during rest state
- Investigate remapping during sleep and timescales of CA1 replay in novel environments

Dopamine Inspired Deep Reinforcement Learning   **2022**
Prof Michael J Frank — Brown University   Remote
- Built and evaluated an actor-critic model based on opponent striatal circuits on sparse-reward Atari games.

Epithelial - Mesenchymal Plasticity in Cancer   **2021 – 2022**
Prof Mohit Kumar Jolly — Indian Institute of Science (IISc), Bangalore   Remote
- Identified the effect of ELF3 gene on transcriptional regulation with non-linear dynamics and machine learning

Awards and Scholarships

Charpak BCS Scholarship	2024
ENS International Selection Scholarship	2024
Selected and funded for ICTP Junior Scientists Workshop on Theoretical Neuroscience	2024
COSYNE Undergraduate Travel Award	2024
ISTern, IST Austria Summer Program	2023
MITACS Globalink Summer Internship [Declined]	2023
Summer Research Award Funding, Next Gen Scientists Foundation	2022
International Research Fellowship, IIT Kharagpur Foundation	2022
Selected and funded for PhD-level NCBS-inStem workshop on Stem Cells	2022
Selected for PhD-level ICTP-ICTS Winter School in Sensorimotor Control	2021
Merit-Cum-Means (MCM) Scholarship, IIT Kharagpur [full tuition + stipend]	2020-2023

Relevant Coursework

Cognitive Science: Computational Neuroscience (with Methods), Learning and Decision Making, Cognitive Modeling of Human Behavior, Evolutionary Foundations of Behaviour
CS: Machine Learning, Deep Learning[2], Statistical Physics of Machine Learning, Math Methods for Data
Math: Nonlinear Dynamics[2], Probability, Statistics, Linear Algebra, Numerical Analysis
Biology: Systems Biology[1], Molecular and Cellular Biology, Cancer Biology[1]

[1] *PhD-level course*   [2] *Online (Stanford, MIT OCW, etc.)*

Programming Skills

Python, Pytorch, MATLAB, Linux (Bash), HPC (SLURM), C/C++

Mentoring

Academic Mentor, IIT Kharagpur   **2022 − 2023**

- Mentored 6 students (2022) and 3 students (2023) in their 1st year to ensure they have a smooth integration to university life and assisting with academic and non-academic matters

English Mentor, IIT Kharagpur   **2022**

- Guided 4 students who struggled with English by providing feedback and solving doubts based on weekly exercises for 1 semester