

Shaurya Goyal

Email : shaurya@kgpian.iitkgp.ac.in

Mobile : +91 8454869021

Website: shauryagoyall.github.io

Education

Indian Institute of Technology (IIT), Kharagpur

2020 - 2025

BS - MS in Economics

CGPA: 8.8

Minor: Mathematics and Computing

Micro-Specializations: Optimization Theory, Artificial Intelligence

Grade 12 (HSC), score: 92%

2020

Grade 10 (ICSE), score: 95%

2017

Honors and Awards

Top 10% grade across students in the department at the end of 3rd semester

2021

Selected for the ICTP-ICTS graduate-level Winter School in Quantitative Systems Biology

2021

Top 10% grade across the institute at the end of 1st year and secured a department change

2021

Research Experience

Indian Institute of Science (IISc), Bangalore

November 2021 – Ongoing

Cancer Systems Biology — Prof. Mohit Kumar Jolly

- Conducted statistical analysis of gene expression data to model the effect of ELF3 and GRHL2 on epithelial(E)-mesenchymal(M) transition as a result of the network topology. **Paper in draft.**
- Conducting analysis into the link between hybrid E/M phenotype cancer cells and stemness

IIT Kharagpur

April 2021 – Ongoing

Evolution of Eukaryotes — Prof. Riddhiman Dhar

On Hold

- Conducting a phylogenetic analysis of cells to understand whether an inside-out or outside-in model is favourable and to understand how mitochondria originated in eukaryotic cells
- Sampled proteomes from orthologous groups of LUCA using python, used MUSCLE for multiple alignment and generated maximum likelihood phylogenetic trees using MEGA

IIT Kharagpur

July – October 2021

Graph Fourier Transform — Prof. Sanand Athalye

- Suggested a faster implementation for the parallel approximate graph fourier transform
- Compared running time of single and parallel approximate graph fourier transform for small graph networks
- Conducted a theoretical analysis for a faster exact graph fourier transform by Haar unit and Givens rotation factoring of graph laplacian eigenspace and reconstructing the graph network

Relevant Coursework

Machine Learning in Genomics², Algorithms², Reinforcement Learning¹, Deep Learning³, Probability, Statistics, Numerical Analysis, Partial Differential Equations, Linear Programming, Ordinary Differential Equations, Data Analysis Lab, Introduction to Biology, Introduction to Psychology

Ongoing: Systems Biology ⁴, Cancer Biology ⁴, Molecular and Cell Biology, Econometrics (with lab)

¹ Stanford, ² MIT-OCW, ³ CMU, ⁴ Postgraduate level course

Selected Projects

Neuron Model Simulation

February 2022

- Simulated the leaky integrate and fire (LIF) model and the Hodgkin-Huxley model for a range of parameters

Reinforcement Learning to Play Pong

October 2021

- Built a reinforcement learning agent that uses deep Q-learning and learns from pixel data to play Pong

Conditional GANs (Guided Reading Project)

July - August 2021

- Conducted a literature review on the theory of cGAN models in recent papers with an emphasis on face generation and other imaging purposes

Modelling Global Warming

June 2021

- Used machine learning to model how the temperatures have changed and used it to predict future changes

Robot Simulation

May 2021

- Simulated a system of floor cleaning vacuum robots in a room with obstacles

Technical Skills

Programming: Python, MATLAB, C, \LaTeX

Libraries: NumPy, PyTorch TensorFlow, OpenAI Gym, SciPy

Workshops / Conferences Attended

Sensorimotor Control

6-17 December 2021

Winter School in Quantitative Systems Biology organized by ICTP-ICTS

Online

Neuromatch 4.0

1-2 December 2021

Conference

Online

High Performance Computing and AI for Computational Biology

29-30 October 2021

Workshop organized by IIT Kharagpur and Tezpur University

Online

Volunteer Work

Academic Mentor

Jan 2022 – Ongoing

UG Council, IIT Kharagpur

- Mentoring 6 students in their 1st year to ensure they have a smooth integration to online university life and assisting with academic and non-academic matters

Teacher(Independent)

October 2019 – December 2020

- Taught 2 under privileged kids in my locality of grade 5 (to grade 6) math, science and English.
- Led to improved understanding and skill and their grade also improved by nearly 20 percent.

Leadership / Extracurricular

- Active member of Biotechnology Reading group at IIT Kharagpur
- Represented institute at various national level debate tournaments as a member of the Debating Society, IIT Kharagpur
- Represented institute in the Inter-IIT Scrabble Tournament
- Selected as Times Scholar (2019) by Times of India Group from 300,000+ students across India
- Silver Medal in National Taekwondo Championship (2017) and 1st Dan Black Belt

Other Interests: Guitar, Piano, Trekking (reached 13120 ft), Running, Rock music, Star Wars