Avrojit Joydhar

INDIAN INSTITUTE OF SCIENCE RESEARCH AND EDUCATION THIRUVANANTHAPURAM

avrojit23@iisertvm.ac.in | in/avrojit-joydhar

github.com/avroj1t

EDUCATION

BSMS   *IISER THIRUVANANTHAPURAM*   **Thiruvananthapuram, India** *2023-2028*

Relevant Courses : Mechanics, Introduction to Mathematical Logic, Calc I,Calc II, Differential Equations, Introduction to AI,Mathematical Foundation to AI, Linear Algebra,Evolution,Introduction to Python, Introduction to C, Introduction to C++,Complex Analysis, Optimization Techniques,Data Analysis Using Python

SKILLS

- **Programming Languages:** Python, R, C++ ,C , Julia , DOT ,Java , FORTRAN, Javascript

- **Python:** numpy, pandas, matplotlib, sklearn,cobra,Tellurium,Antimony, building CLI tools

- **R:** tidyverse, ggplot

- **MATLAB:** data visualisation, linear algebra,sysBio

- **Julia:** BifurcationKit

- **General Coding:** git, bash, shell, JQuery

- **Markup:** Latex, HTML, CSS

- **Software:** CompuCell3D, Visual Molecular Dynamics(VMD),Lammps, Random Circuit Pertrubation (RACIPE),PhysiCell, Obsidian, MATLAB, Canva, Figma

UNDERGRADUATE RESEARCH EXPERIENCE

Param Hansa Centre for Computational Oncology (IISc Bangalore)   **Bengaluru,India** *6/2025 -7/2025*

Summer School in Computational Oncology/ Mathematical Oncology, PI: Dr. Mohit Kumar Jolly

- A Multi-Scale Hybrid Model of CSC Emergence Through IL-6 Signaling: Integrating GRNs into Agent-Based Tumor Simulations

- Integrated GRN into CompuCell3D using Tellurium (Antimony → SBML → SBMLSolver pipeline) for intracellular cell-specific behavior.

- Constructed ODE-based GRNs using shifted Hill equations to simulate bistable stemness dynamics (LIN28/let-7 toggle switch)

- Used MultiScale Modelling to Simulate the emergence of Cancer Stem Cells

- Designed custom CC3D Steppables (e.g., IL6PulseSteppable, GRNExecutionSteppable) to simulate cytokine dynamics and stochastic fate switching.

- Github : Here

School of Mathematics(SoM, IISER Thiruvananthapuram)   **Thiruvananthapuram,India** *8/2024 -12/2024*

Semester project in Applied Mathematics, PI: Dr. Sudarshan Kumar

- Title: Numerical Analysis of Partial Differential Equations

- Working on Simulating different Partial Equations

School of Mathematics(SoM, IISER Thiruvananthapuram)   **Thiruvananthapuram,India** *5/2024 -8/2024*

Summer project in Applied Mathematics, PI: Dr. Sudarshan Kumar

- Title: Solutions to Ordinary Differential Equations and Applications

- Worked on Simulating different Methods and Solutions to ODEs both Classical and Modern Solutions

- Implemented some methods on Normal Equations and simulated it using ggplot and Python

- Github : Here

OUTREACH

Frontier Symposium- School of Mathematics(SOM) *11/2024*
- Designed the website for Frontier Symposium for Mathematics 2025-Link

IGEM 2024 *(Volunteer)* *5/2024 - 9/2024*
- Designed the IGEM WIKI-PETAL

Science and Technology Council, *(Coordinator)* *1/2024 - present*
- Participated in the first Outreach Programme at JNV, Vithura.
- Helped in developing Science Activity Centre
- Developed Cafe Scientifique: a one-on-one friendly session between professors and students
- Making the Official Science and Technology Website

Exhibit A- Science Magazine *(Coordinator)* *6/2024 - present*
- Maintaining the Exhibit A Website

Crucible- IISER TVM Science Activity Centre *(Coordinator)* *6/2024 - present*
- Developed and Maintaining the Crucible Website with Dr Sanu Shameer

PARSEC-The Astronomy Club *(Head)* *6/2024 - present*
- Social Media Management
- Deploying the official PARSEC Website
- Conduct Outreach Sessions
- Manage the Treasury of the Club

ONLINE COURSES

- Nonlinear Systems Chaos: An Introduction [Certificate]

ACHIEVEMENTS

- JEE ADVANCED Rank Under 9500 out of 100,000 Candidates