Curriculum Vitae

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Education

–2013	CISCE 10th Board in Bangalore, Karnataka
2013–2015	Karnataka Pre University Board (11th and 12th) in Bangalore, Katnataka
2015–Current	Integrated BS-MS at Indian Institute of Science Education and Research, Kolkata

Ongoing Work

August 2019 - Present	**Masters Thesis**
August 2019 - Present	**Non-linear Workbook in Python**
Sep 2019 - Present	**Complex Systems in Finance**

Past Experience

Summer 2019 | **Stochastic Amplification of Ecological Systems**
Dr. Amos Maritan — University of Padua, Italy
Population Level Models often show different behaviour than Individual Level Models because the PLMs are mean field equivalent of the ILMs. In particular, Lotka Volterra equations in finite size systems do not show cyclic populations (unlike infinite population size model). But in observation, we see many predator prey systems having cycles. This can be explained using tools of stochastic processes (like Fokker Planck Equation, van Kampen Expansion, Langevin Dynamics) which manage to include the finite size effects and stochasticity in the population to qualitatively show cycles in population with finite size. The same tools were also extended to MacArthur Consumer Resource model to show non trivial power spectrum of simulated time series population data.

Summer 2018 | **Analysis of Template directed Polymerization**
Dr. Supratim Sengupta — IISER Kolkata
RNA replication should have preluded DNA replication. But there is evidence to suggest that a pre-RNA world existed where replication occurred due to self replicating polymers, that led later to complex structures like RNA. In such a self replicating polymer, the conditions of template directed polymerization were studied.

Summer 2017 | **Extreme Events on Complex Networks**
Dr. MS Santhanam — IISER Pune
Work here primarily consisted of running simulations of random walks on complex graphs to check for a pattern arising in extreme events i.e, paths with low probability and to see if it would help in prediction of probability of occurrence of paths in the graph.

Summer 2016 | **Game Theory and Population Dynamics**
Dr. Sandeep Krishna — NCBS Bangalore
This was mainly a reading project in Game Theory. The basics of Game Theory was studied and some simulations of three player and five player games (equivalent to Rock Paper Scissors and Rock Paper Scissors Lizard Spock) was done. Towards the later part of the summer, population dynamics model of Cuscuta (a plant that is a parasite of plants) was attempted and prelimnary simulations were run.

Conferences and Workshops

July 2019 | **Conference on Complex Systems - 2019 — Trento, Italy**
Organized by Complex Systems Society, Italy

[1]Indian Institute of Science Education and Research

Relevant Courses

Spring 2019	**Evolutionary Dynamics** A course on introduction to evolutionary dynamics ideas like fitness landscape, sequence spaces, evolutionary games, finite population games and evolutionary graph theory.
	Statistics Laboratory Introduction, visualization and computation of various statistical tools using MATLAB.
	Advanced Statistical Mechanics An advanced course on statistical mechanics dealing with topics such as mean field theory and renormalization group theory.
	Soft Matter Physics An introductory course on soft matter systems using tools learnt in statistical mechanics. Topics range from broken symmetry to elasticity.
Fall 2018	**Non-Linear Dynamics** Introduction to the basic ideas of nonlinear dynamics and chaos in classical systems modelled by ordinary differential equations and iterated maps
Fall 2017	**Computational Physics** Course primarily covered introduction to some of the widely used methods of computational physics. Emphasis was on numerical methods of differentiation, integration, solving ODEs and PDEs and Monte Carlo methods. Problems from classical mechanics, quantum mechanics and statistical physics were tackled.

Languages Known

Java	Beginner proficiency
Python	Advanced proficiency (packages used: NumPy, matplotlib, SciPy, NetworkX)
LaTeX	Intermediate proficiency
gnuplot	Intermediate proficiency in graphing software
HTML and CSS	Intermediate proficiency

Extracurricular Activities

Inquivesta 2016	**Annual College Fest** Web development team and Event Organizer (Debate and Oratorial)
Inquivesta 2017	**Annual College Fest** Events Coordinator
Aarshi 2017	**Dramatics Club of IISER Kolkata** Club Treasurer
Aarshi 2017	**Annual Drama Production** Part of Cast in full length production
Campus Radio 2018	**College Radio Station** Chief Operations Officer
Lexis 2018	**First Literary fest of IISER Kolkata** One of the founding Core Committee Members