

Pursuing Minors in Physics

## SCHOLASTIC ACHIEVEMENTS

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- Secured **All India Rank 9** in **IIT JEE-Advanced** out of 220,000 candidates (2017)
- Secured **All India Rank 95** in **JEE-Main** out of 1.2 million candidates (2017)
- Attended **Vijyoshi Camp** which serves as a forum for interactions between bright young students and leading researchers in fields of Science and Mathematics held at **IISER**, Kolkata (2016)
- Awarded a **Gold Medal twice**, for being amongst the **top 35** students in **INPhO** (Indian National Physics Olympiad) and attended two weeks long **Camp** held at **HBCSE**, Mumbai twice (2016,2017)
- Amongst the **top 46** students in **INChO** (Indian National Chemistry Olympiad) (2017)
- **Twice** amongst the **top 35** students in **INAO** (Indian National Astronomy Olympiad) and attended two weeks long **Camp** held at **University of Mumbai** (2016,2017)
- Amongst the **top 300** students who qualified for **INJSO** (Indian National Junior Science Olympiad) (2014)
- Qualified **twice** for **INMO** (Indian National Mathematics Olympiad) (2015,2016)
- Qualified for **Junior Indian National Astronomy Olympiad** (2014)
- Secured **All India Rank 52** in 11th and **All India Rank 84** in 12th in **KVPY** out of 60,000 candidates and awarded the prestigious **KVPY Fellowship twice** by **DST**, Government of India (2015,2016)
- Awarded the prestigious **NTSE Fellowship** by **NCERT**, Government of India (2015-present)

## PROJECTS

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### Secure Personal Cloud

Ongoing

*Prof. Soumen Chakrabarti (Software Systems Lab) — Course Project*

IIT Bombay

- Implementing a **cloud based file system** like google drive with recursive tree directory structure support
- Enabling **encryption** of data on server using block level file encryption technique
- Enabling support for multiple clients simultaneously with synchronization across clients upon request
- Developing a mobile friendly web client using Django which can display all the files in server
- Enabling regular backup of server data to different backup server and automatic rendering of common file types

### Car racing using Artificial Intelligence

Spring 2018

*Prof. Amitabha Sanyal (Programming Paradigms Laboratory) — Course Project*

IIT Bombay

- Developed a real-time computer vs human car racing game using racket and its libraries
- Implemented an **AI algorithm** to detect a path for the computerized car in any given image of a racing track
- Used **Racket Graphical Interface Toolkit** to make the simulator interactive and user friendly
- Designed and implemented algorithms to handle collisions and overtaking between cars in an efficient way

### Machine Learning

Summer 2018

*Summer of Science*

IIT Bombay

- **Certified** for a report on Machine Learning prepared after 2 months of detailed study and practice
- Completed an 11 week Machine Learning **Coursera** course by **Andrew N.G.** covering **Supervised learning**, **Unsupervised learning** and some of the best practices in Machine Learning

### Movie Recommender System and Anomaly Detection

Summer 2018

*Self Project*

IIT Bombay

- Implemented the **anomaly detection** technique to detect failing servers on a network
- Used **collaborative filtering** technique to develop a movie recommendation system

## Image Compression

Self Project

Summer 2018

IIT Bombay

- Implemented **K-means clustering** algorithm to compress an image by around a factor of 6
- Used **principal component analysis** to find a low-dimensional representation of facial images

## Hand written digits recognition System

Self Project

Summer 2018

IIT Bombay

- Implemented **one-vs-all logistic regression** to recognize hand-written digits in the MNIST dataset
- Used the **backpropagation algorithm** to recognise hand-written digits and achieved an accuracy of **95.3%**

## GitHub Search for Android

Prof. Soumen Chakrabarti (Software Systems Lab) — Course Project

Autumn 2018

IIT Bombay

- Built an android application to find users on GitHub by username using **cURL** calls to GitHub's public API
- Used `URLConnection` to download the data and **AsyncTask** class for searching on a separate thread
- Designed an interface to display list of users found and their corresponding repositories in a new intent

## SAT-solver

Prof. Amitabha Sanyal (Programming Paradigms Laboratory) — Course Project

Spring 2018

IIT Bombay

- Used **Davis-Putnam-Logemann-Loveland (DPLL)** procedure, a SAT solving method
- Found a solution of an **N-queens problem** using this method

## Regular Expression Parser

Prof. Amitabha Sanyal (Programming Paradigms Laboratory) — Course Project

Spring 2018

IIT Bombay

- Used regular expressions as a way to describe strings with certain properties
- Implemented a **matcher/recognizer** for regular expressions with the help of trees

## TECHNICAL SKILLS

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### Programming

Python, C++, C, Racket, Java, Bash, Prolog, Octave

### Web Development

HTML, CSS, PHP, JavaScript, Bootstrap, Materialize, Django

### Software

Git, MATLAB, CMAKE, Android Studio, L<sup>A</sup>T<sub>E</sub>X, Gnuplot, AutoCAD, Solidworks

## POSITIONS OF RESPONSIBILITY

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### Teaching assistant

PH 107 - Quantum Physics and Application

Autumn 2018

IIT Bombay

- Tutoring a class of 50 students for the first year course under Prof. S. Uma Sankar
- Responsible for teaching and evaluating them and providing feedback to the course Instructor-in-charge

### Organiser, Techfest

Asia's largest Science and Technology festival || Footfall: 175,000+ || 250+ events

2017

IIT Bombay

- Responsible for handling artists and overall logistics during the events
- Planned and coordinated along with a team of organisers to execute the **AI summit** in front of a live audience

## COURSES UNDERTAKEN

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Data Structures and Algorithms + Lab\*, Discrete Structures\*, Data Analysis and Interpretation\*, Software Systems Lab\*, Design and Analysis of Algorithms\*\*, Digital Logic Design + Lab\*\*, Logic for Computer Science\*\*, Computer Networks + Lab\*\*, Abstractions and Paradigms in Programming + Lab, Computer Programming and Utilization, Calculus, Linear Algebra, Differential Equations, Introduction to Electrical and Electronics Circuits\*, Quantum Physics and Application, Basics of Electricity and Magnetism, Engineering Graphics and Drawing, Physical Chemistry, Organic and Inorganic Chemistry, Biology

\*to be completed by November 2018

\*\*to be completed by April 2019

## EXTRACURRICULARS

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- Completed a year long training of **Table Tennis** under National Sports Organization(NSO), IIT Bombay (2017)
- Awarded a **Bronze** medal in **ITTL**, Institute Table Tennis League (2018)
- Completed **three** courses; **Electricity and Magnetism** by Rice University, **Mechanics** by MIT, **Waves and Oscillations** by Rice University and received respective certificates on **EdX**, an online platform (2014)
- Secured **third** position for making a bot for an obstacle racing competition **XLR8** among 120 teams (2017)
- Secured **third** position in **Potpourri**, a competition organised by the **Institute Cultural Council** (2017)
- Completed **Web development**, **Python** and **Machine learning** bootcamps organized by Career Cell(2018)