

Education

2013–2017 **Bachelor of Technology (Honors)**, *Indian Institute of Technology, Bombay*, GPA – 9.3/10.0.
Computer Science and Engineering

Scholastic Achievements

- 2016 AP grade (given to **top 2%**) in 6 courses, including all 4 mathematics courses
- 2015 **Team rank 27** among 300+ teams in ACM ICPC Amritapuri Regionals
- 2014 Institute Academic Award for being in the **top 10** out of over 800 students
- 2013 Secured **All India Rank 33** in JEE Advanced (previously IIT-JEE) among 0.15 million contesting candidates and emerged as the Uttar Pradesh State topper
- 2013 Obtained **100 percentile** in JEE Main (previously AIEEE) among 1.5 million candidates, with all India highest score of 115/120 in Chemistry
- 2013 Certificate of Merit and Gold medal in Indian National Olympiad in Physics and Chemistry for being among the **top 35** in the country
- 2013 Among the **top 8** of the country who were selected to represent India at the 14th Asian Physics Olympiad, 2013, Bogor, Indonesia

Internship Experience

- Nov 16 - **Machine Learning Engineer Intern**, STEALTH MODE STARTUP.
 - Present
 - Used keras library in **Python** to build deep neural networks, thereby increasing the accuracy the algorithm from 80% to 95%
 - Redesigned the entire backend, including machine learning API and unit testing framework.
- Nov 16 - **Global Alpha Researcher**, TREXQUANT INVESTMENT LP.
 - Present
 - Working on development of profitable trading signals based on real-world data for medium-frequency equity trading and implementing the same using **MATLAB** interface
 - Studying finance based research papers to figure out new alpha ideas.
- May 16 - **Software Engineering Intern**, RUBRIK INC., Palo Alto, CA, USA.
 - Jul 16
 - Investigated the stability and performance of CockroachDB as a replacement to Cassandra in existing Rubrik file system's file metadata store
 - Wrote **C++** code to redesign the filesystem to use CockroachDB as the metadata store
 - Wrote correctness tests and benchmarks in **Python** to compare CockroachDB with Cassandra
 - Received a **return offer** from Rubrik for outstanding performance during the internship.
- May 15 - **Research Intern**, TU BRAUNSCHWEIG, Braunschweig, Germany.
 - Jul 15
 - Studied the algorithms related to swarming robotics, an upcoming field of robotics which involves coordination of simple robots to perform powerful tasks
 - Studied Triangulation Problems, Tree Exploration Problem and Inverse Art Gallery Problem
- Dec 14 - **Research Intern**, INDIAN INSTITUTE OF TECHNOLOGY, Kanpur, India.
 - Jan 15
 - Studied iterative algorithms for statistical curve fitting and implemented in **MATLAB**
 - Also studied the impact of noise distribution on the nature of the curve

Projects

- Operating Systems **Deduplicating File System using FUSE.**
 - Used FUSE to design and implement a deduplicating file system in **Python**
 - Implemented block level deduplication by taking SHA256 hash of each data block
 - Used a backend **postgres** database to reduce the required storage by a factor of about 64

- Operating Systems **File Server with associated Shell based client.**
- Used socket programming libraries of **C** to design a file server to handle concurrent clients
 - Programmed a shell based client and implemented various other features like pipe, redirection and signal handling, foreground and background processes
 - Studied web server overload in terms of latency and throughput measurements
- Deep Learning **Convolutional Neural Network for Car Recognition.**
- Used Tensorflow (**Python**) to implement a car recognition system using deep learning
 - Implemented convolutional neural network to achieve over 90% accuracy on test data
 - Implemented a keras (Python) model to compare performance with Tensorflow model
- Deep Learning **Devanagari Script alphabet recognition system using Tensorflow.**
- Used Tensorflow (**Python**) to build a deep network for Devanagari character recognition
 - Investigated the impact of the width, depth, learning rate, regularization and hidden unit type on the accuracy of recognition system
- Machine Learning **Smart Keyboard.**
- Used techniques and algorithms of Natural Language Processing to develop a smart keyboard application in **Python**
 - Implemented spelling correction and word prediction using sklearn and NLTK
- Artificial Intelligence **Simulation of Genetic Algorithm (Artificial Intelligence).**
- Programmed an implementation of Genetic Algorithm in **Java**
 - The program takes an image from the user as input and reconstructs the image using a fixed number of circles and rectangles
 - Implemented various aspects of the algorithm including mutation, crossover and elitism
 - Ran the program for several images like abstract images, logo of various companies, animals, etc
- Artificial Intelligence **Planet Wars Bot.**
- Programmed a smart heuristic (bot) in **C++** to play the game of Planet Wars
 - Implemented future prediction mechanism to tackle the opponent bot smartly
 - Suggested the concept of a frontier mechanism to strengthen the defense of the bot
- Databases **Banking Made Easy.**
- Programmed the client and the server end of a banking application using **Java** Servlets
 - The application connects to a remote **postgres** backed database server
 - Worked on the security aspects of the application for the prevention of SQL injection and XSS attacks
- Databases **External Merge Sort and Hash Join.**
- Implemented external merge sort supporting generalized k way merge, and simulating merge sort for large files using **C++**
 - Also implemented the hash join algorithm to join 2 large relations
 - Analyzed performance statistics of the algorithms and worked on further improvements
- Compilers **Compiler for a subset of C language.**
- Created a compiler for C programming language to generate MIPS32 assembly code
 - Coded from scratch, various features like lexical analysis, syntax tree creation, parsing and assembly level code generation
 - Implemented structs, type checking, pointers and many other common features of C
- Web Dev **Q/A platform for competitive exam preparation.**
- Used Django (**Python**) backed server to build a Quora like web application
 - Designed the database schema from scratch and used **MySQL** as backend database
 - Used Rake Library in Python to automatically extract tags and topics from asked questions
 - Implemented newsfeed, upvotes, downvotes, user profile and follow features
- Web Dev **Bodhitree Multimedia Textbook.**
- Worked on the feature development of a large scale **Django** based multimedia textbook
 - Designed a review mode feature that helps the user easily review the videos
 - Programmed a notifications panel that displays the number of unwatched pending videos
- Web Dev **Photo Gallery Web App in Django.**
- Created a photo gallery web application in Django (**Python**)
 - The application extracts the images of a certain hash tag from Twitter and displays them in the form of an image gallery
 - Implemented user-authentication features (login, logout, register) from scratch

Web Dev **JEE Seat Allocation Web App in Django.**

- Studied Gale-Shapley algorithm for finding a stable matching and implemented it in **Java**
- Used the implementation of the algorithm to solve a seat allocation based problem
- Developed an associated **Django** based web application to allow students to fill their seat preferences for JEE counseling (a competitive exam in India)

Android **Location based Social Networking App.**

- Programmed an **android** application for a location based social network, supporting features of multicast within a distance
- Added settings to alter multicast distance as well as feed interval
- Also added a message labeling feature for SOS messages

Android **Sunshine Weather App.**

- Used the Open Weather Map API to create a simple weather application in **android** studio as a part of Udacity's Android development course
- Implemented features like ListView, Fragments, SQLite database, Content Providers, Share Intent and Map location intent

Android **My Timetable App.**

- Created a simple timetable management app in **Android** Studio.
- The application can store classes along with timings in an SQLite database and then retrieve daily classes and display them in a ListView

Android **Blog Android Application.**

- Used the Blogger API to program an android application for blog using **android** studio
- Implemented refresh mechanism to fetch latest articles from the blog
- Implemented the share intent to share the link of blog

Skills & Interests

General Distributed Systems, Scalable Databases, Machine Learning

Languages Python, C/C++, Java

Development Web Development (Django), Android App Development

Tools \LaTeX , Bash Scripting, MATLAB, GNU Octave, Prolog

Others Cryptography, Computer Networks, Assembly

Other Academic Achievements

2015 Among the **top 20** across India to be shortlisted for Cargill Global Scholarship 2015

2013 Cleared National Standard Exams in Physics and Chemistry, being among the **top 300** nationally

2013 **All India Rank 105** in KVPY among over 50,000 contesting candidates

2013 CBSE Certificate of Merit in Physics for being among the **top 0.1%** in India

2011 Conferred with the title of Amul VidyaShree for securing **97.4%** in High School

2011 **All India Rank 42** in the Resonance Start Exam, **All India Rank 27** and North India **Zonal Rank 2** in FIITJEE FTRE and **All India Rank 83** in FIITJEE NSTSE among thousands of candidates across the country

Positions of Responsibility

Jul 15 - **Department Academic Mentor.**

- April 16
- Among the **14 people** to be chosen as Department Academic Mentor for CSE Department
 - Responsible for guiding 10 sophomore students with their academics and curriculum

Jul 14 - **Teaching Assistant.**

- Nov 15
- Selected 8 times and served **3 times** as a TA for Computer Programming and Utilization, Electricity and Magnetism and Introduction to Calculus courses at IIT Bombay
 - Responsible for guiding students with tutorial problems for better understanding of the course material

Jul 14 - **Convener at Rubik's Club.**

- Jul 15
- Served one full term as a Convener at Rubik's Club at IIT Bombay
 - Responsible for conducting workshops and events to teach speedcubing