




Amit Rajaraman




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Experience

- 2021  **Summer Internship** *Guide: Navin Goyal | Microsoft Research, Bengaluru*
- Working towards proving the **KLS Conjecture** and **Hyperplane Slicing Conjecture**, elusive problems in high-dimensional geometry, using the **(stochastic) localization** method
 - Prepared a **report** on the topics studied, covering several topics in **asymptotic convex geometry** from scratch
 - Working on a modified version of a **k -input output pairs communication** problem
- 2020  **Red Flag: Plagiarism Checker** *Guide: Prof. Amitabha Sanyal | IIT Bombay*
- Implemented a modified version of **latent semantic analysis** which calculates the cosine similarity between different vectors in the covariance matrix corresponding to the data
 - Added further functionality for **reliable detection** if the program is written in C++, Python, or Java for ignoring language-specific syntax
 - Built a user interface using **Angular** with a **Django** backend where registered users can upload and process files and view the similarities between the different pairs, visualised as a heat map
- 2021  **IITB Proc** *Guide : Prof. Virendra Singh | IIT Bombay*
- Developed a **16-bit processor** using **VHDL** to execute operations based on instruction format
 - Implemented a **finite state machine** for the execution of 15 instructions in a **6-stage pipeline**






Reading Projects

- 2020  **Topics in Algebra II Course Project**
Prepared a presentation on the **quiver of the Tits algebra** and the **Saliola lemma**
- 2020  **Probability Theory** *Self Project*
Studied probability theory and measure theory from *Probability Theory* by Achim Klenke
Learnt topics related to **branching processes**, the **laws of large numbers**, and **Markov chains**
- 2020  **Automata Theory** *Self Project*
Studied Automata Theory from *An Introduction to the Theory of Computation* by Michael Sipser
Covered topics such as **deterministic** and **pushdown automata**, **context-free grammars**, and examined some results related to the **Černý conjecture**





Education

- 2019 – 2021*  **Indian Institute of Technology Bombay, India** 9.78 CPI
B.Tech. *Computer Science and Engineering*
- 2017 – 2019  **Sri Chaitanya Junior College, India** 97.80%
Intermediate/+2
- 2010 – 2017  **Delhi Public School, Hyderabad, India** 10.0 GPA
Matriculation




Scholastic Achievements

- 2019  Secured **All India Rank 12** in **JEE Advanced** among 245,000 aspirants
- 2019  Secured **All India Rank 102** in **JEE Main** among 1.2 million aspirants
-  Awarded AP grade in
 - 2020 MA106 (**Linear Algebra**), awarded to 8 out of 1108 students
 - 2019 CS101 (**Computer Programming and Utilization**), awarded to 1 out of 1212 students
 - 2019 MA105 (**Calculus**), awarded to 35 out of 1137 students
- 2019  Secured **All India Rank 2** in the admission test to **Indian Statistical Institute, Kolkata**
- 2019  Scored **415/450** in **BITSAT** (Birla Institute of Technology and Science Admission Test)



Scholarships and Recognition

- 2017  Recipient of the prestigious **Kishore Vaigyanik Protsahan Yojana** (KVPY) Fellowship
- 2019  Amongst the **top 300** students across the nation in **NSEC** and appeared for the **INChO**
- 2019  Amongst the **top 300** students across the nation in **NSEA** and appeared for the **INAO**
- 2015  Attended a camp in Delhi for securing **All India Rank 33** in the **DPS Talent Examination**




Technical Skills

- Programming  C++, C, Python, Bash, Java, C#, VHDL, Julia
- Software  MATLAB/GNU Octave, Git, \LaTeX , LEAN, Unity
- Libraries  NumPy, Pandas, Matplotlib, Scipy, PyGame, z3py





Select Courses Undertaken

- Computer Science  Artificial Intelligence and Machine Learning, Special Topics in Automata and Logics, Discrete Structures, Data Analysis and Interpretation, Computer Networks, Design and Analysis of Algorithms, Logic for Computer Science, Operating Systems
- Mathematics  Graph Theory, Topics in Algebra II, Real Analysis, General Topology, Linear Algebra

Miscellaneous

- 2020  **Teaching Assistant, MA 109 (Calculus I)** *Instructor: Prof. Ravi Raghunathan | IIT Bombay*
Responsible for conducting tutorial sessions for a batch of **45 students** throughout the semester, helping them clear conceptual doubts through personal interaction, and correcting answer sheets
- 2021  **Mentor, Summer of Science**
Mentored freshmen interested in **topology** and **graph theory** by recommending resources and clearing doubts
-  **Mathematics StackExchange**
Have garnered over **3100 reputation** on Math StackExchange and reached over **11000** people

Extracurriculars

- 2019  Successfully completed a year-long course under **NSO** in **Table Tennis** in the freshman year
- 2019  Engineered an **app-controlled bot** as a part of XLR8 competition organized by ERC, IIT Bombay
- 2020  Secured **first position** in the Bamboozled competition conducted by MnP Club, IIT Bombay
- 2019  Secured **second position** in the Bazinga! Physics competition conducted by MnP Club, IIT Bombay