SHRIOM KUMAR SINGH

ACADEMIC DETAILS

Year	Degree / Board	Institute	GPA / Marks(%)
---	B.Tech in Electrical Engineering	Indian Institute of Technology Delhi	9.17/10
2021	High School (Class 12th)	Rahul International School	93.4%
2019	Matriculation (Class 10th)	Poddar Brio International School	95%

SCHOLASTIC ACHIEVEMENTS

- **B-83 Merit award:** Awarded for exceptional performance in academics and scoring a **CGPA>9/10** in the first year of study.
- **JEE(Advanced) 2021:** Secured a rank of **533** amongst **140,000** candidates across India who qualified JEE(Mains).
- **JEE(Mains) 2021:** Secured an All India Rank of **860** amongst **2.2 million candidates** across India.
- **Kishore Vaigyanik Protsahan Yojana (KVPY)** Fellowship Award 2021 by IISC : Secured All India Rank **797** in SX category.
- **National Talent Search Examination :** Selected as a **national talent** for qualifying both stages of the NTSE examination.
- **National Standard Examination in Junior Science :** Qualified **NSEJS** and was selected to appear in the **INJSO** and **INAO** exam.
- **Gold medal, Homi Bhabha Young Scientist Examination:** Awarded for designing a **sustainable tourism model** of **Matheran**.

PROJECTS

- **Agent Based Modelling to predict human behaviour in calamities (Anshuka A., UNSW)**: (November, 2022-Feb, 2023)
  - Studied and learnt **MESA**, an **agent-based modelling** framework in python using official documentations and online implementations.
  - I created a model by modelling agents as humans using MESA library in Python, which can mimic the **response of human beings** and predict the final statistics and optimal paths in case of a natural calamity(in our case, flood).

- **Maximum possible data transfer in a network(Prof. Ashish Chiplunkar, Prof. Naveen Garg)** (November 2022) :
  - Modelled the problem as finding the maximum capacity path between two points in an **undirected weighted graph**, here capacity is minimum of all edge weights in a path, also the maximum data that can be transferred without failure.
  - Modified the **Djikstra's Algorithm** for shortest paths and achieved a time complexity of **O(nlogn)** for n transmitting points in a network.

- **Probabilistic Pattern Searching Model and tolerance control (Prof. Naveen Garg, Prof Ashish Chiplunkar)** (October, 2022) :
  - Implemented **Rabin Karp** complete and partial string matching algorithm in **logarithmic** time and working space complexity.
  - I was able to control the accuracy of the code by selecting optimal **prime numbers** using the **prime number theorem**.

- **Collision finder for one dimensional system of particles (Prof. Ashish Chiplunkar, Prof Naveen Garg)** (August, 2022) :
  - Implemented **binary min-heap** data structure in python to efficiently model **high-frequency collisions** of a system of point masses.
  - Achieved a time complexity for n particles and m collisions as **O(n+mlog(n))** and observed that the number of collisions converged to **pi**.

- **Find nearby points in a 2 dimensional coordinate plane(Prof. Ashish Chiplunkar, Prof Naveen Garg)** (September, 2022) :
  - Implemented **2-D range tree** for a two coordinate system in **O(nlog(n))** time mimicing Google maps **search nearby** feature.
  - Performed nearby search queries in **logarithmic** time and further improved complexity using **fractional cascading**.

- **Riderless Bicycle control (Prof. Shubashish Dutta)** (Control Engineering, MATLAB)(Jan, 2023 - May, 2023) :
  - Modelled bicycle as a **Closed-Loop Control System** based on **Carvallo Whipple Model** and studied the transfer function.
  - Using knowledge of **root locus, bode, nyquist** in control systems theory, designed an autopilot for a bicycle for velocities in the range 3.5 m/s to 4.1 m/s using the **PI/PD/PID** controllers in MATLAB **Control System Designer** tool.

- **Python based compiler for while loops and mathematical expressions (Prof. Preeti Ranjan Panda)** (Feb, 2022 - March, 2022) :
  - Studied the **internal workings** of python programming language, about its management of **function call stacks, data and garbage**.
  - Designed a **compiler** based on python which could take inputs from text files and analyse **while loops** and simple mathematical operations by keeping **track of data** and **removing garbage** values periodically.

TECHNICAL SKILLS

- **Programming**: C, C++, Python, MATLAB, Verilog, Git
- **Design and editing**: Autodesk Inventor, LaTeX

EXTRA CURRICULAR ACTIVITIES

- **All India inter AEES quiz :** Won **second prize** in the **all India** inter AEES quiz organised by Department of Atomic Energy.
- **Distinction, Australian National Chemistry Quiz :** Was awarded certificate of **distinction** in ANCQ for stellar performance.
- Active participant in **National Service Scheme (NSS)**, took part in **blood donation camps, teaching and awareness campaigns**.

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IIT COURSE

Degree	Institute	CGPA
B.Tech in Electrical Engineering	Indian Institute of Technology Delhi	9.17/10

COURSES DONE

Intro. To Computer Science, Calculus, Linear Algebra & Differential Equations, Probability & Stochastic Processes, Discrete Mathematical Structures, Control Engineering I, Microeconomics, Macroeconomics, Data Structures And Algorithms, Signals And Systems, Digital Electronics.

QUALIFYING EXAM

- **Joint Entrance Examination (JEE) Advanced Rank:** 533

EXTRA CURRICULAR ACTIVITIES

- Member, Buddy Program (June, 2022 - May, 2023)
- Moderator, Startup Expo (June, 2022 - May, 2023)