



Snehadeep Gayen | CS21B078
B. Tech (Hons.) Computer Science and Engineering
Minor in Mathematics



EDUCATION

B. Tech CSE CGPA 9.94/10 <i>Indian Institute of Technology Madras</i>	📅 Jul '21 - Present 📍 Chennai, TN
HSC Class 12th 98.17% <i>Pace Junior Science College</i>	📅 Apr '19 - Apr '21 📍 Mumbai, MH
ICSE Class 10th 98.80% <i>Lilavatibai Podar High School</i>	📅 Apr '18 - Apr '19 📍 Mumbai, MH

EXPERIENCE

Software Internship at Optiver Amsterdam 📅 May'24 - Jul'24

- Worked in the Quant Research Data Team of Optiver Delta1
- Added functionality to create TCP/IP filters from session configuration files for packet parsers and optimised them for performance.
- Added functionality to convert timestamps across timezones, accounting for Daylight Saving Time changes
- Replaces a saturated Postgres database with a OneTick database, optimising the schema based on past SQL queries to minimise query time.

Axishkar Hyperloop, Student Team, CFI 📅 Oct '22 - Jul'23

- Part of Embedded Software Team of the **Main Control Unit** and **Navigation Unit** of our Hyperloop Pod.
- Used **RTOS** to collect and store data from **over 20 sensors** using various communication protocols at **low latency**.
- Demonstrated our Hyperloop Pod in the prestigious **European Hyperloop Week - Scotland 2023** among over 25 teams globally, and were **awarded runner-up in the Best Sense and Control System** category.

Teaching Assistant, CSE Dept, IIT Madras 📅 Aug '24 - Present

- Worked as a Teaching Assistant and designed Verilog labs for Computer System Design course under Dr. Sutanu Chakraborty

Tutor & Contributor, NPTEL 📅 March '23 - Jun '23

- Created **YouTube tutorials** for previous years' GATE CS questions
- These tutorials aim to support applicants who may have limited access to resources

CODING ACHIEVEMENTS

- **Rating 1806 Expert** on Codeforces
- **ICPC 2022 - AIR 151** and **Institute Rank 7** in Kanpur Qualifiers
- **AIR 3** in Shaastra CP Potpourri (Mixed-bag coding contest)
[Shaastra is Asia's largest student-run Techfest]
- **Global Rank 9** in CodeChef Starters 96 | **Global Rank 231** in Codeforces Round 881 | **Rank 2** in Republic Day Contest '24 and **Rank 3** in Endgame Contest organised by Programming Club, IITM
- 1st place in Inter-School Java Competition in Mumbai

KEY COURSES & LABS

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|------------------------------------|---------------------------------------|
| • Computer System Design | • Router Architecture & Algorithms †* |
| • Data Structures | • Principles of Economics |
| • Computer Architecture | • Microeconomics, Macroeconomics * |
| • Theory of Computation | • Introduction to Game Theory |
| • Object Oriented Programming | • Probability Theory † |
| • Compiler Design | • Combinatorics † |
| • Operating Systems | • Linear Programs & Optimisation † |
| • Functional & Logical Programming | • Linear Algebra † |
| • Computer Networks | † - Graduate Level Course |
| • Patterns & Machine Learning | * - Ongoing |

SOFTWARE SKILLS

- **Languages:** C++, C, HDL (Verilog), OCaml, Python, Java, Prolog, SQL, x86, MIPS and 8085 ASM, L^AT_EX, HTML & CSS, R
- **Tools:** CMake, Make, git, gdb/lldb, TI CCS, AutoCAD, GTKWave
- **Libraries:** TI RTOS, Boost, Xerces, ESP32 libraries, Python libraries

SCHOLASTIC ACHIEVEMENTS

- Awarded Sri V Ramachandran Prize for **Highest CGPA** in Semesters 3 & 4 of B.Tech and Dual Degree in Computer Science
- Secured **AIR 5** in JEE Mains '19 out of 1 million students
- Secured **AIR 161** in JEE Advanced '19
- Secured **AIR 10** in Indian Statistical Institute Exam
- Secured **AIR 21** in INChO and attended Orientation Camp for International Chemistry Olympiad
- Awarded KVPY Fellowship '21 with **AIR 338**
- Winner of Mimamsa '22 at IISER Pune | 4th place in Chemenigma '22 at IIS Bangalore | Won Silver Medal in Homi Bhabha Science Competition (conducted in Maharashtra)

RESEARCH

WiFi Sensing for IoT using Machine Learning *C, Python*

Undergraduate Research under Prof. Ayon Chakraborty

- Created an end-to-end IoT pipeline for real-time Human Activity Recognition using WiFi CSI (Channel State Information) Sensing and Machine Learning on the Server
- Analysed the effect of compression on CSI data and its tradeoffs on the Network Bandwidth, Energy Consumption & Sensing Accuracy.
- This work has been accepted in **AIoT workshop at MobiHoc '24 organised in Athens, Greece**.

Custom Protocol Headers for Network Support *P4, Python*

Undergraduate Research under Prof. Krishna Moorthy Sivalingam *Ongoing

- Ideating on a custom protocol header to improve network telemetry or security using P4 switch data plane programming language.
- Deployment & Testing on Intel Tofino switches

PROJECTS

Java Compiler Design 📄 *Java, C*

CS3300 Course Project - Prof. Krishna Nandivada 📅 Jul-Nov '23

- Developed a **5 stage** compiler, from a **subset of Java to MIPS** Assembly.
- Used JavaCC and Java Tree Builder to implement lexical analysis, type-checking, semantic analysis, IR translation and register allocation.

OS Scheduler and Memory Management Unit Design 📄 *Java*

CS3500 Course Project - Prof. Prashant LA 📅 Jul-Nov '23

- Developed a Multi-Level Feedback Queue process scheduler and a Memory Management Unit with an LRU page replacement policy.

LAN Chatroom, Music Streaming & HTTP Server 📄 *C*

CS3205 Course Project - Prof. Ayon Chakraborty 📅 Jan-May '24

- Developed a LAN Chatroom Server scratch using only Unix Sockets
- Built a Music Streaming server and client using Unix sockets and ALSA.
- Developed a simple multithreaded HTTP Server capable of serving files and handling GET and POST requests

CPU Design 📄📄 *Verilog*

CS2610 Course Project - Prof. C. Chandra Sekhar 📅 Jan-May '23

CS2310 Course Project - Prof. Ayon Chakraborty 📅 Jul-Nov '22

- Implemented a CPU with **Register file** and **ALU** with instructions to perform Arithmetic and Logical operations on both 8-bit integers and 12-bit floating-point numbers
- Built a combinational 8-bit CPU with structural gate-level Verilog

Closeness Centrality Algorithm 📄 *C++*

Project under Prof. Manikandan Narayanan 📅 May-Jun '23

- Implemented the CENDY algorithm, an on-line algorithm for updating Average Path Length and Closeness Centrality in a Dynamic Graph, based on this paper. 📄

EXTRACURRICULAR ACTIVITIES

- **Sports:** Awarded 13 medals in Track & Field and Best Athlete U14 in High School, Taekwondo Red Dan II Belt, NSO Athlete at IITM
- Mentored incoming freshmen under **Saathi, IIT Madras**