Snehadeep Gayen | CS21B078

B. Tech Computer Science and Engineering

Indian Institute of Technology, Madras

EDUCATION

B. Tech CSE | **CGPA 9.94** — Jul '21 - Present

Indian Institute of Technology Madras — Chennai, TN

HSC Class 12th | **98.17%** — Apr '20 - Apr '21

Pace Junior Science College — Mumbai, MH

ICSE Class 10th | **98.80%** — Apr '18 - Apr '19

Lilavatibai Podar High School — Mumbai, MH

EXPERIENCE

Software Internship at Optiver Amsterdam — May'10 - Jul'10

- Worked as a part of the Quant Research & Data Team of Optiver Delta1
- Added functionality to create TCP/IP filters from session configuration files for the Network Parser and Optimized them for performance
- Added functionality to convert timestamps across timezones taking DST changed into consideration
- Analysed SQL queries & designed a new OneTick database with Schema to shift an overburdened PostGres time series database.

Undergraduate Research (WiFi Sensing for IoT)

- Created an end-to-end IoT pipeline for Human Activity Recognition using WiFi CSI Sensing
- Analysed the effect of compression on CSI data and its tradeoffs on the Network Bandwidth, Energy Consumption & Sensing Accuracy.
- Submitted part of the work in AIoT workshop organised in Greece.

Undergraduate Research (Implementing Custom Protocol Headers with P4 for Networked Application Support)

- Ideating & implementation of a custom protocol header using the recent Data Plane programming language P4 on a Intel Tofino switch.

Theory & Lab Teaching Assistant for Computer System Design Course *(Ongoing) — May'10 - Jul'10

- Designed Verilog labs for Computer Science Sophomores to test various Computer System Design topics.

Team Avishkar Hyperloop, CFI — Oct '22 - Present

- Part of Code Development Team of the **Main Control Unit** and **Navigation Unit** of our Pod.
- Used **RTOS, threading** and communication protocols like MQTT, CAN, etc. to collect and store data from over 20 sensors at **low latency**, **handling faults** appropriately.
- Participated in the prestigious **European Hyperloop Week - Scotland 2023**, among over 25 teams globally to represent the country.

Tutor & Contributor, NPTEL — March '23 - Present

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

CODING ACHIEVEMENTS

- Maximum Rating 1678 (Expert) on Codeforces
- **ICPC 2022 - AIR 151** and **Institute Rank 7** in Kanpur-Mathura Qualifier Round
- **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
- **Global Rank 373** in Google Farewell Round B
- 1st place in Inter-School Java Competition in Mumbai

SOFTWARE SKILLS

- **Languages**: C++, C, HDL (Verilog), OCaml, Python, Java, Prolog, SQL, x86, MIPS and 8085 ASM, HTML & CSS, R
- **Tools**: TI CCS, Git, LaTeX, AutoCAD, GDB
- **Libraries**: TI RTOS, NumPy, PyLops, Matplotlib

EXTRACURRICULAR ACTIVITIES

- **Sports:** School Sports Captain for 2018-19,
  Awarded 13 medals in various Track & Field events and Best Athlete U14 in High School
  Taekwondo Red Dan II Belt, NSO Athlete at IITM
- Mentored freshmen, personally and academically, under **Saathi, IIT Madras**
- Avid book reader and Tabla player

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 out of 1 million students
- Secured **AIR 161** in JEE Advanced
- 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
  4^{th} place in Chemenigma '22 at IISC Bangalore &
  Won Silver Medal in Homi Bhabha Science Competition (conducted in Maharashtra)

PROJECTS

Java Compiler Design *Java, C*

CS3300 Course Project - Prof. Krishna Nandivada Jan-May '23

- Implemented a fully functional compiler for a subset of Java with Lexical Analyser, Parsing, Type Checking, IR Generation, Register Allocation, Stack Handling, and MIPS code generation

MMU with LRU replacement *Java*

CS3500 Course Project - Prof. Prashant LA Jan-May '23

- Implemented a Memory Management Unit with LRU Page replacement Policy

Multi-Level Feedback Queue Scheduler *Java*

CS3500 Course Project - Prof. Prashant LA Jan-May '23

- Implemented a Multi-Level Feedback Queue Scheduler for processes

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 from gate level

Reading Project and Presentation

CS6122 Course Project - Prof. B. V. R. Rao Jan-May '23

- Presented the paper on *"Smoothed Analysis of Partitioning Algorithms for Euclidean Functionals"* by *Bläser, M., Manthey, B. & Rao, B.V.R.* and discussed its applications

Closeness Centrality Algorithm *C++*

Project under Prof. Manikandan Narayanan May-Jun '23

- Implemented the CENDY algorithm based on this paper
- This on-line algorithm updates Average Path Length and Closeness Centrality of all nodes in a Dynamic Graph

COURSES & LABS

- Basic Electrical Engg
- Computer Systems Design
- Programming and Data Structures
- Computer Organisation and Architecture
- Design & Analysis of Algorithms
- Theory of Computation
- Probabilistic, Smoothed Analysis of Algorithms (PG)
- Object Oriented Programming
- Discrete Maths
- Basic Graph Theory
- Probability, Statistics & Stochastic Processes
- Series and Matrices
- Multivariable Calculus
- Ordinary Differential Equations (PG)
- Principles of Economics
- Intro to Game Theory
- Compiler Design *
- Operating System *

* Ongoing