Prakhar Gupta

Indian Institute of Technology, Goa

Fourth Year **Undergraduate**, **Computer Science and Engineering**
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Education

BTech, Computer Science and Engineering, Indian Institute of Technology Goa	CGPA : **7.49/10**	2021 – Present
Class 12, CBSE, St.Xavier's High School, Ailwal	Aggregate: **93.2** %	2019 – 2021
Class 10, ICSE, Jyoti Niketan School, Atlas Tank	Aggregate: **95.4** %	2017 – 2019

Projects

WRKFLOW [Github] (May 24 – Jun 24)

- Built Dashboard Web App which is a powerful tool for individuals looking to enhance their productivity by effectively tracking goals and managing tasks. Its **MERN** stack foundation with MVC architecture ensures a reliable, robust and scalable application.
- Integrated Client-Side Rendering **(CSR)** with React for a responsive user interface ensuring initial load times of under 2 seconds.
- Handled Backend by Express.js and **Mongoose**, integrated with MongoDB which supports rapid query execution with average response times for CRUD operations below 50 milliseconds.
- Managed user authentication via username and password credentials, with session management maintained through secure **HTTP cookies**, typically completing within 100 milliseconds.

Simple Physics Engine [Github] (Mar 24 – Apr 24)

- Designed Physics Engine for point objects, rigid bodies to simulate their interaction in different environments based on principles of classical mechanics managing over 1000+ point objects.
- Modelled on **C++ with SDL 2**(Simple DirectMedia Layer) library based on OpenGL provided efficient low-level way to handle graphics, audio, input and other multimedia functionalities.
- Extended application simulator to **Multi Thread** for efficient handling of user input and Physics using Thread STL, synchronizing between different threads using mutex yielding 30% faster computation time.
- Created key component features like entity,motion dynamics, **collision detection and handling**, fixed and variable time stepping, FPS management from ground up.

Lab Coordinator [Github] (Feb 24 – Mar 24)

- Deployed Lab assessment web application for seamless coordinating between students, TAs and other faculties managing multiple hierarchical user login and respective privileges, tested for more than 50 simultaneous logins.
- Used **SQL** based relation database management system SQLite, an open source which supports ACID (Atomicity, Consistency, Isolation, Durability) transactions providing query execution time of less than 1 millisecond.
- Developed using **NodeJS** and **EJS** for accessing Javascript runtime environment and Javascript template engine respectively.
- Constructed the Backend of **User Management System**, **Viva Scheduling**, Grading Management, Analytics and Reporting for efficient coordination and ensuring seamless experience for both students and examiners.

Super Unity Mario[Github] (May 24 – Jun 24)

- Super Unity Mario is a classic platformer game developed in **Unity** inspired from the iconic 1985's Super Mario series, featuring original mechanics focusing initially on the 1st level.
- Introduced unique platforming mechanics, such as advanced player movement with acceleration and deceleration dynamics. Jump mechanics include variable jump heights based on input duration, enhancing player control.
- Implemented with a robust **game manager** system handling various aspects such as player health and lives management, scoring mechanisms of 100 points per coin collected, checkpoint systems at level start, spirite animations and 60 fps deployment.

Skills

Programming Skills:	C, C++, C#, Python, Java, Haskell, JavaScript, TypeScript, Bash, R, Prolog, VHDL, SQL, MIPS Assembly.
Software Skills:	Auto-CAD, Solid works, Unity, LaTex, Git, GitHub, VS, VS Code, Vivado Xilinx, IntelliJ IDEA, Anaconda.
Frameworks/Libraries and OS:	Ubuntu, Fedora, Windows, Node, Express, Spring Boot, Bootstrap, React, MongoDB, Mongoose, TensorFlow, Sci-kit-learn, OpenGL, SDL, CUDA C, Posix.
Relevant Coursework	Data Structures and Algorithms, Algorithm Design, Computer Networks, Machine Learning, Artificial Intelligence, Probability and Statistics, Optimisation, Computer Architecture, Compiler Design, Unix Tools.

Positions of Responsibility

Wing Representative	Hostel Wing Representative in Student Panchayat	(2022 – 2023)
Core-Member	Alpha - Finance Club of IIT Goa	(Mar 23)
Event Overseer	Cepheus KBC Event Overseer	(2023 – 2024)

Extracurriculars & Hobbies

- Committed to environmental stewardship, volunteering with Varaha, the Climate Change Society of IIT Goa, to clean various beaches.
- Gaming enthusiast, engaging in fps, strategic, indie and open-world gameplays.
- Competitive table tennis player, participating in tournaments and friendly matches in spare time.
- Dedicated bookworm with a love for literature, exploring diverse genres and authors.