Vaibhav Gupta

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Education

University of Toronto Scarborough — Toronto, ON
Honours Bachelor of Science in Computer Science — *Sep. 2023 – Sep. 2027*

Sir John A. Macdonald CI — Scarborough, ON
Ontario Secondary School Diploma (OSSD) — *Sep. 2019 – Jun. 2023*

- Graduated with 98% Top 6 average
- Ontario Scholar

Technical Experience & Leadership

Vice President of Technology — Toronto, ON
C.R.E.A.T.E. Club, University of Toronto Scarborough — *Nov. 2024 – Present*

- Lead technical initiatives and oversee technology strategy for university's premier computer science and engineering club with 100+ members
- Spearheaded development of the club's official website using React and TailwindCSS, serving as the primary information hub for students and faculty
- Manage GitHub organization infrastructure for 40+ student developers, implementing version control best practices and granting tiered access permissions to project leads
- Collaborate with executive team to design and implement streamlined project onboarding processes, reducing new member integration time by 50%
- Organize and support technical workshops, hackathons, and coding competitions to foster learning and collaboration among students
- Mentor junior students in software development practices, code review processes, and project management methodologies

Academic Projects

QualiD App and Website | *Intro to Software Engineering Course* — *Jan 2025 – April 2025*

- Built a comprehensive web platform for QualiD, a startup focused on simplifying ESG (Environmental, Social, and Governance) reporting through centralized data management and AI integration
- Collaborated with a cross-functional team of 3 other students to design scalable system architecture and develop intuitive user interfaces following software engineering best practices
- Implemented Agile development methodologies, conducting regular sprint reviews, and maintaining comprehensive documentation
- Contributed to requirements analysis, system design, and full-stack development using modern web technologies
- **Technologies Used:** Django, TailwindCSS, JavaScript, PostgreSQL, WebRTC, OpenAI API
- **Learning Outcomes:** Software engineering lifecycle, team collaboration, client communication, scalable system design

HikeOn Event Planning Application | *Software Design Course* — *Sep 2024 – Dec 2024*

- Designed and developed a comprehensive event planning and safety guide application to assist users in organizing and navigating outdoor recreational activities
- Applied object-oriented design principles and design patterns including MVC, Observer, and Factory patterns
- Implemented real-time weather integration and safety alert systems for enhanced user safety during outdoor events
- Developed intuitive mapping features for event location planning and route tracking with user-friendly GUI using Java Swing
- Conducted thorough testing including unit tests, integration tests, and user acceptance testing
- **Technologies Used:** Java, Java Swing, WebRTC, OpenAI API, Google Maps API
- **Learning Outcomes:** Software design patterns, object-oriented programming, GUI development, API integration

RAID Storage Simulator | *Software Tools & System Programming Course* *March 2025 – April 2025*

- Implemented a sophisticated RAID 4-like distributed storage system in C, demonstrating understanding of fault-tolerant storage architectures
- Developed low-level block read/write operations with robust inter-process communication using pipes between controller and multiple simulated disk processes
- Engineered comprehensive fault tolerance mechanisms including simulated disk failure scenarios and automatic data recovery using parity reconstruction algorithms
- Implemented advanced signal handling (SIGINT, SIGPIPE) for graceful system shutdown and error recovery to ensure data integrity and system resilience
- Conducted extensive testing of failure scenarios and recovery procedures
- **Technologies Used:** C, Unix/Linux system calls, inter-process communication
- **Learning Outcomes:** Systems programming, distributed systems, fault tolerance, low-level programming

Dr. Mario Game Implementation | *Computer Organization Course* *Oct 2024 – Dec 2024*

- Developed a fully functional Dr. Mario game implementation in MIPS Assembly language, demonstrating mastery of low-level programming concepts
- Implemented complex game mechanics including gravity simulation, collision detection, and match-three puzzle logic using only assembly language constructs
- Created dynamic visual elements including animations, sprite rendering, and real-time score visualization using memory-mapped display
- Designed efficient data structures and algorithms for game state management, including grid-based memory structures and color-coded storage systems
- Integrated audio components and sound effects to enhance user experience while working within assembly language constraints
- **Technologies Used:** MIPS Assembly, Staurn coding environment
- **Learning Outcomes:** Computer architecture, assembly programming, memory management, algorithm optimization

Turtle Graphics Engine | *Introduction to Computer Science II* *June 2024*

- Built a comprehensive turtle graphics engine in C, inspired by the Logo programming language, focusing on data structure implementation and memory management
- Implemented custom linked list data structure with full CRUD operations (insert, delete, search, modify) to efficiently store and manage complex drawing command sequences
- Developed modular command parsing system to interpret and execute turtle movement commands with proper error handling and validation
- Integrated with pre-built graphics renderer to generate visual output, focusing on program execution logic and algorithmic thinking
- Implemented comprehensive testing framework including both interactive and automated testing workflows
- **Technologies Used:** C, Custom data structures, Graphics libraries
- **Learning Outcomes:** Data structures, memory management, modular programming, testing methodologies

Professional & Hackathon Projects

SafeOStroll - AI Safety Application | *Hack the Valley 9* *November 2024*

- Developed an innovative AI-powered safety application in 36 hours, designed to monitor user emotional states in real-time and provide appropriate interventions
- Implemented advanced emotion recognition algorithms and natural language processing to assess user wellbeing through voice and text interactions
- Integrated seamless voice communication using WebRTC technology to enable continuous, hands-free interaction between users and AI safety system
- Incorporated HERE Maps API for precise location tracking and intelligent emergency routing to connect users with nearby mental health resources and emergency services
- Designed responsive user interface with accessibility considerations for users experiencing emotional distress
- **Technologies Used:** Python, Django, React, PostgreSQL, WebRTC, HERE Maps API, NLP libraries

C.R.E.A.T.E. Club Website | *C.R.E.A.T.E. Club* *May 2025*

- Designed and developed comprehensive club website serving as central hub for 100+ members and university community
- Implemented modular component architecture for easy content management and future scalability
- **Technologies Used:** React, TailwindCSS, Responsive Design

Code Clash Prediction Platform | *C.R.E.A.T.E. Club Gameathon* *June 2025 – July 2025*

- Designed and architected a sophisticated full-stack prediction platform for live hackathon events, enabling real-time user engagement and competition tracking
- Developed comprehensive backend API using Django with RESTful endpoints for team registration, match result updates, and dynamic scoring algorithms
- Built responsive React frontend with real-time data synchronization, featuring live leaderboards and interactive prediction interfaces
- Successfully deployed and managed platform during live event with 25 total participants, achieving 100% uptime and handling 9 concurrent active users
- Implemented advanced features including automated scoring systems, real-time notifications, and comprehensive analytics dashboard
- Demonstrated expertise in rapid prototyping, live system monitoring, and handling real-time user interactions under pressure
- **Technologies Used:** Django, React/JSX, WebSocket, PostgreSQL, RESTful APIs

Chess Game Visualization System | *C.R.E.A.T.E. Club Gameathon* *April 2025 – May 2025*

- Developed interactive chess game simulator with JSON-based game replay functionality and clean GUI interface
- Implemented dynamic piece rendering and move log display system using Python and Tkinter
- **Technologies Used:** Python, Tkinter, JSON, Object-Oriented Design

Advanced Tic-Tac-Toe Game System | *C.R.E.A.T.E. Club Gameathon* *April 2025 – May 2025*

- Created extensible Tic-Tac-Toe game supporting multiple game modes and customizable board sizes beyond traditional 3x3
- Designed modular architecture supporting human vs. human, human vs. AI, and AI vs. AI gameplay modes
- **Technologies Used:** Python, Tkinter, Game AI Algorithms

Technical Skills

Core Languages: Java, Python, C, JavaScript, HTML/CSS
Familiar With: MIPS Assembly, BeautifulSoup, NumPy, PostgreSQL
Frameworks & Libraries: React, Django, Flask, TailwindCSS, Node.js, JUnit, WebRTC
Developer Tools: Git, Docker, VS Code, IntelliJ
APIs & Services: OpenAI API, HERE Maps API, Cohere

Awards & Achievements

Ontario Scholar - Graduated high school with 98% average (2023)

Medallion (Highest Honor for 90% above avg) - Grade 10-12 (2020-2023)

Honor Roll - Grade 9 (2019)

Relevant Coursework

Completed: Introduction to Computer Science I & II, Software Design, Computer Organization, Software Tools & System Programming, Introduction to Software Engineering

References

Available upon request