Syed Kaab Surkhi

Bachelor of Computer Engineering

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EDUCATION

Bachelor of Engineering (B.Eng), Computer Engineering, Toronto Metropolitan University *2023 - 2028*
Relevant Courses: COE 318 - Software Systems | COE 428 - Engineering Algorithms and Data Structures | COE 528 - Object Oriented Eng Analysis and Design | ELE 404 - Electronic Circuits I | COE 328 - Digital Systems | COE 538 - Microprocessor Systems

TECHNICAL SKILLS

Programming Skills: Python, C++, C, C#, MATLAB, Java, MySQL, Postgres, Assembly
Frameworks: Flask, Node.js, React.js, Tailwind CSS, OpenCV, Websocket, PyGTK, Ros2, TCP, Streamlit, MCP, FastAPI, JavaFX
Tools: CAD, 3D Print, Electric Circuits, Git, Firebase, Arduino, Quartus, Unity, Supabase, Vector DB, Oracle, AWS, Huggingface, Pandas

WORK EXPERIENCE

Research Practicum Assistant, Toronto Metropolitan University, May 2024 - May 2025

- Evaluated 3 international research papers and **benchmarked** curriculum outlines from over thirteen Canadian universities; **pinpointed** key textbooks, culminating in comprehensive recommendations for a redesigned Linear Algebra course structure.
- Collaborated with a professor and a team of 3 assistants to **design an impactful teaching plan** for a first-year Linear Algebra course.
- **Partnering** with organizations to **develop an open-source textbook** in **PreText**, **transitioning** concepts from pre-calculus to advanced university-level mathematics.

Network Programming Controls and Web Developer, Metropolitan Hyperloop**,** Sep 2024 – Ongoing

- Collaborated with four different operation-teams such as marketing to **develop a promotional website,** utilizing **React.js and Tailwind CSS** and **designing** a multi-tier sponsorship benefit system.
- Built a **GUI** with **python PySide6** to display significant readout data when running the pod, and connected a central **RaspberryPi** to the backend of the **GUI** via **TCP Connection** for successful transmission of the data.

Software Developer, Toronto MetRobotics Oct 2024 – Ongoing

- Implemented a **control program** for a **Robotics Rover**, enabling simultaneous **component management** through a game controller, and **transmitting** data with the **Pysocket and Websocket libraries**.
- Developed a **GUI** for a 10-camera system on the rover with **PyGST** with the use of **TCP Connections** and **CLI tools** for testing.
- Incorporated **dual production pipelines** with **SRT** and **UDP** to efficiently target different needs such as faster or smooth streaming.

Full Stack Developer, Momentum AI May 2025 – Ongoing

- Worked with a group of developers in a **startup** to create an **AI full stack study application** with five different tools such as **Agentic AI flashcards generator, study planner, exam generator**, and **RAG** trained studying assistant.
- **Implemented** the complete functionalities in a **Flask python backend** connected with a minimal **React.js frontend** along with **Postgres SQL** and **Vector databases** such as on **Supabase** along with complex **Git** management.
- **Hosted events** at educational institutions such as a **hackathon** at Brock University, **mentoring** newcomers and **pitching** the startup.

Term Project Leader, Toronto Metropolitan University Sep 2023 – Nov 2023

- **Facilitated** a 10-member team in **redesigning** the **3D printing process,** integrating environmental and efficiency improvements while **consulting** with the team advisor and group advisors weekly in various team meetings for areas of revisions**.**
- **Researched** safer alternatives and **programmed** the fill process in **Java** leading to development of **3 iterations** of the process redesign.

Lead Engineer and Fullstack Engineer, Echolabs (PM-Accelerator) June 2025 – Ongoing

- **Facilitated,** managed and led a **7-member engineering team** of various roles while working closely with **project managers** and **designers** to finish a **startup MVP** in a tight deadline of 10 weeks at **PM Accelerator**, securing 3rd place and **hosted** on **AWS**.
- Created an **automated** B2B ticket organizing platform **startup**, converting customer complaints to testable **product experiments** with **agentic prompt classification**, **RAG** based similarity **clustering**, **RAG hypothesis generation**, and multi platform integration.
- Utilized tools like **postgres SQL** and **vector DB** in **Supabase**, **huggingface embedding models**, **node.js**, and **python FastAPI**.

TECHNICAL PROJECTS

Inclusee, Hackthe6ix | *ReactJS, Adobe-Add-On-SDK, css3, JavaScript* July 2024

- Programmed an Adobe Express Add-On within 36 hours, **enhancing** design accessibility for users with low vision, dyslexia, and other impairments; currently **undergoing** review for the official Adobe Add-On marketplace.
- Incorporated **real-time feedback** by analyzing colors, fonts, and layouts used with **React.js, Javascript, and CSS.**

Vireel, Google Gemini API Developer Competition | Startup | *Flask, Python, ReactJS, TailwindCSS, GeminiAPI, JavaScript* Aug 2024

- Engineered a news aggregation app, integrating four **APIs** including **Gemini** and **News API** to **curate** personalized, concise news for users in the **Google Gemini API Developer Competition**.
- **Leveraged** the **React.js** framework and **Tailwind CSS** for the frontend, with **Python Flask** for the backend, to build a comprehensive full-stack social media app, featuring messaging, liked articles, and genre customization.

BetEd, Snowflake Rag 'n' Roll Competition | *Streamlit, Python, WebScraping, JavaScript, RAG, TailwindCSS, Firebase, Snowflake* Jan 2025

- Developed a networking **platform** for inexperienced tech seekers to **collaborate** on challenging competitions while being tutored by a **trained learning model** and receiving feedback from professionals at the **Snowflake RAG competition**.
- Implemented **Retrieval Augmented Generation (RAG)** for training an AI model with the use of **Snowflake** database for storing documentation, **Mistral LLM** for generation, **Cortex Search** for retrieval, and **Streamlit** for the frontend display.

BookCartFX, | *Java, JavaFX, SceneBuilder, FXML, UML Modeling, Design Patterns, Java GUI, Netbeans* Mar 2025

- Developed a 5 stage multi screen Bookstore **GUI** application in **Java** and **JavaFX**, implementing **secure user authentication**, **encrypted data storage**, and real-time book management functionalities.
- Worked with a team to design and implement **system architecture** using **UML modeling** and **design patterns**, ensuring scalability.

Simple Central Processing Unit (CPU) | *VHDL, FPGA, CPU, Digital Systems, Altera Quartus, Block Schematics, Waveforms* Dec 2024

- Programmed a **16 bit multi-functional CPU** in a **VHDL** environment on an **FPGA board** that uses two 8 bit inputs, clock inputs, enable inputs, and resets to provide hexadecimal output effectively. **Programmed** using **VHDL** code on **Altera Quartus**.
- **Implemented** different functionalities using an **FSM state machine**, **latches**, a **decoder**, **7 segment converters**, and **arithmetic and logic units (ALU cores)**. Used **block schematics** and logic **waveforms** to simulate CPU before implementation on the board.

Job Application Scraper, | *Javascript, React.js, Python, Flask, Scrapers, Gemini, RAG, Oracle, Supabase, Postgres, Vector DB, Docker* Sept 2025

- Created a **job scraper** for up to date jobs from large sources such as **Linkedin** based on user provided parameters using **Nodriver**, **Crawl4AI**, and **bs4**. **Stored** job postings in **structured formats** on a **postgres Supabase database** along with job tracker implementation.
- Enveloped an **ATS friendly resume reworder** that **tunes** the master resume and **matches** the resume content to the job description using **multi-model LLMs** such as **Gemini** and **Ollama**.
- **Hosted** the **frontend** and **backend servers** on **Oracle**, navigating throughout setting up **networking, security, and cloud**. **Created** a **RAG** knowledge base **discord chatbot** with **vector chromaDB integrated** with the job tracking functionality as well.

Nodify, SolutionHacks | *React.js, Python, FastAPI, Supabase, Postgres, MCP Clients, OpenCV, Dlib* June 2025

- Built a platform to bring **accessibility** to individuals suffering with physical limitations through **customizable** facial expression to digital commands **mappings**. **Created** with **react.js** and **fastAPI** with **python**, and detected with the help of **opencv** and **dlib**.
- **Implemented** the user custom add new commands by importing **MCP clients** on the frontend, and stored on a **postgres Supabase DB**.

ExploreWorld Unity

- Created a solo exploration game with a task objective of exploring the physics concepts and principles such as gravity, acceleration, mass, and forces on various in-game objects with **C#** in **Unity**. Includes the control of over two vehicles with different physics principles.
- Integrates components such as terrain and over six skyboxes, utilizing Unity's **physics engine** to create a challenging simulation game.

Embedded Vision Controlled Car

- Built an Arduino car using various **components** including motor controllers, motors, ESP32 CAM, Arduino Uno, and Servo Motors.
- Made with **C++** and further developing it to perform tasks such as image recognition and target locking with **OpenCV.**

DinoNFT, HawkHacks

- Made a **web3** video game similar to that of the google offline game using **Javascript** and **p5.js** in a competitive event within 48 hours and secured 3rd place win in the web3 category
- Incorporate a reward system for the player by connecting their blockchain wallet to the game, and transfer tokens based on their scores

Land Average Temperatures Analyzer,

- **Developed** a **C** program that studies different average land temperatures over 3 centuries using **CSV files** and outputs different averages.
- Used **GNU Plots** to create different plots in respect to the outputted data to evaluate trends and report conclusions.