

EDUCATION

- McGill University** Aug 2024 — May 2027
Bachelor's of Science, Computer Science Montreal, QC
- Relevant Coursework: **Data Structures and Algorithms**, Computer Graphics **Algorithm Design**, Operating Systems, Intro to Robotics
- Vanier College** Aug 2022 — May 2024
DEC, Computer Science and Mathematics Montreal, QC
- College Beaubois** Aug 2017 — June 2022
High School Diploma Montreal, QC

WORK EXPERIENCE

- Technology Support Intern** May 2022 — Aug 2022
College Beaubois Montreal, QC
- Managed and reset school-wide iPad infrastructure using **Cisco Meraki** in preparation for the new academic year
 - Designed and maintained an **Excel tracking system** to monitor classroom device status with colleagues
 - Securely wiped and decommissioned legacy lab computers using **Parted Magic (Linux)**
 - Installed new computers in the computer lab and offices and added them to the school's network for management purposes

PROJECTS

RAG Notes (Local LLM Study Assistant)

- Developed a **fully local RAG (Retrieval-Augmented Generation) pipeline** that allows users to ingest class notes and query them through a conversational interface through semantic search
- Built a **Bun-based terminal application** in **TypeScript** with a streamlined CLI workflow for fast note indexing and querying
- Integrated **LangChain** with **Ollama-hosted local LLMs** to enable private, offline question answering without external API dependencies
- Designed the system to prioritize **privacy, low-latency inference, and reproducible local deployment**
- github.com/philipsoitu/rag-notes/

Kinect Scanner

- Developed **3D scanning app** leveraging *Xbox Kinect* to capture **RGB-D spatial data** and reconstruct **3D models**
- Interfaced directly with *Xbox Kinect* hardware using the open-source **libfreenect** driver for low-level device communication
- Implemented a **producer-consumer concurrency** model to **accelerate** frame processing on a **Raspberry Pi**, utilizing **multi-core parallelism** in **Zig**.
- Used **Nix** to manage dependencies and enable **reproducible cross-compilation** across **ARM** and **x86** Linux systems.
- github.com/philipsoitu/kinect-scanner

Ray Tracer (School Project)

- Built a realistic physically based ray tracer with support for **reflections, refractions, and dielectric materials; motion blur**, using time-dependent ray sampling, **depth of field blur** enabling realistic lens effects.
- Added **motion blur** by introducing time-dependent ray sampling and per-geometry temporal transforms.
- Integrated **HDR environment maps** using **equirectangular projection** for physically accurate background maps.
- Used **Taichi** for **GPU Compute** for significant speed up targeting many backends such as **Vulkan, CUDA, and Metal**
- Private repository available upon request

SKILLS

- **Programming Languages:** Java, Python, JavaScript, C, Zig, OCaml, Bash, X86 Assembly
- **Technologies:** React, Next.js, FastAPI, Git, Neovim, UNIX, Google Cloud Platform, Nix. PostgreSQL

HACKATHONS

- AI Semester Scheduler** *SvelteKit, Bun, MongoDB, Google Gemini 2.5 Flash, PDF.js, Auth0* January 2026
Link: devpost.com/software/ask-ethan *Concordia University*
- Built an **AI-powered deadline management system** that parses syllabi and assignment docs using document AI to create a unified student task calendar.
 - Implemented dual AI parsing pipelines to extract structured schedule data with robust error handling and created intuitive UI/UX with real-time task views.
- Crochet Visualizer** *FastAPI (Python), Trimesh, NumPy, SvelteKit, MongoDB, Auth0* January 2026
Link: devpost.com/software/crochet-bltopw *McGill University*
- Built an **automated 3D-to-crochet pattern generator** that processes 3D mesh uploads and produces round-by-round crochet instructions with configurable parameters, making complex crochet design accessible to users.
 - Implemented geometric slicing and contour tracking algorithms to calculate optimal stitch counts and generate compact crochet notation, paired with an interactive frontend.
- RoadTrippin' Club** *Next.js, Node.js, MongoDB, Auth0, Mapbox* April 2025
Link: devpost.com/software/roadtrippin-club *John Abbott College*
- Built a **collaborative road trip planner** website that lets users create and coordinate shared itineraries with real-time updates and interactive maps.
 - Implemented **authentication, persistent trip data storage, and map-based UI** to enable seamless multi-user trip planning and activity voting.
- Ecodex** *Next.js, Python, Flask, PyTorch, Google Cloud, Beautiful-Soup* February 2025
Link: devpost.com/software/ecodex-eatys0 *Polytechnique Montréal*
- Built an **environmental discovery app** that uses **custom ML models** to identify species from user photos and provide actionable ecosystem awareness and educational insights.
 - Integrated **camera uploads, cloud-hosted backend, and interactive species feedback** to inspire biodiversity exploration and conservation action within communities.
- PicItUp** *Next.js, Node.js, React, Socket.io, TypeScript* January 2025
Link: devpost.com/software/pic-it-up *Concordia University*
- Built a web app that uses **websockets** technologies to put student's in realtime treasure hunt challenges, where we leveraged **Computer Vision AI Models** to track the game state.
- Circuit Clash** *Python, SvelteKit, Xata, OAuth* March 2024
Link: devpost.com/software/circuit-clash *Yale University*
- Built an **interactive educational platform** with a custom and simplified hardware description language (SHDL) that translates student-friendly code into **dynamic logic circuit visualizations** to teach Boolean logic fundamentals.
 - Implemented a **custom parser** and backend in Python with a SvelteKit frontend, enabling real-time rendering of circuits and an intuitive learning experience for novice hardware learners.
- PulseInterview (AI Interview Helper)** *SvelteKit, OpenAI API, Google Cloud Platform* January 2024
Link: devpost.com/software/pulseinterview *Concordia University*
- Built a web app that **leverages GenAI** to **generate** interview questions and **analyse** candidate answers
- BuildMyCV** *Kotlin (Android), Python, MongoDB, OpenAI API* January 2024
Link: devpost.com/software/buildmycv *College Jean-de-Brebeuf*
- Built an **Android AI-assisted resume generator** that lets users write a personal introduction, generate professional CVs, and send tailored cover letters to recruiters.
 - Integrated **OpenAI-based content generation** with persistent storage and seamless UX to simplify résumé creation and personalization.
- ELeetMath (Realtime 1v1 math game)** *Next.js, Socket.io, WolframAlpha API* February 2023
Link: devpost.com/software/eleetmath *Polytechnique Montréal*
- Built a web app that uses **websockets** technologies to put student's in 1v1 math games with **Elo rating system**
- TrashLink** *Next.js, Python, Docker, Kubernetes, TensorFlow, RaspberryPi* February 2022
Link: devpost.com/software/enron3 *Polytechnique Montréal*
- Built an **IoT** waste management system to monitor bin levels and visualize status. This was my **first hackathon** :)