

RICKY TANG

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EDUCATION

University of Waterloo
Honours Bachelor of Software Engineering (Co-op)

Expected Apr. 2030

EXPERIENCE

Waterloo Aerial Robotics Group (WARG) | *Python, OpenCV, Pymavlink* Oct. 2025 – Present
Autonomy Software Developer Waterloo, ON

- Implemented computer vision algorithms using OpenCV for real-time object detection and tracking in aerial imagery
- Engineered MAVLink workers for heartbeat monitoring, telemetry streaming and command processing via IPC queues
- Orchestrated main thread coordinating worker processes, integration testing, and centralized logging across system

Brick Works Academy Jun. 2024 – Jul. 2024
Co-op Camp Counselor Waterloo, ON

- Led robotics programming instruction for 20+ campers, teaching Python integration with LEGO Mindstorms hardware
- Mentored 7-person collaborative robot development project resulting in functional writing automation robot
- Designed 10+ programming challenges for sensor control, motor optimization, and debugging techniques

PROJECTS

🔗 **BrainLattice** – AI Concept Networks from Any Textbook | *Python, FastAPI, TypeScript, Next.js, Firebase, GCP, Docker*

- Engineered full-stack application transforming 100+ page textbooks into interactive concept networks in <20 seconds using PyPDF extraction, Gemini API, and React Force Graph, replacing linear note-taking with network-based learning
- Architected Firebase schema with bidirectional relationships enabling real-time traversal of 200+ concepts with on-demand AI insights (e.g. overviews, formulas, connections) via click
- Constructed automated study pipeline generating cheat sheets and realistic audio digests from LLM scripts via ElevenLabs
- Deployed on GCP with Docker, integrating multiple AI APIs (Gemini, OpenRouter, ElevenLabs) for end-to-end workflow

🔗 **Post-It** – AR Sticky Notes for Real World | *TypeScript, Snap Lens Studio*

- Engineered Spectacles lens enabling users to place 3D sticky notes in physical locations, transforming spaces into shared interactive canvases using World Query Module and Spatial Anchors API
- Constructed voice-to-3D pipeline: ASR module transcribes speech, Gemini optimizes prompts, Snap3D generates objects
- Integrated gesture-based interactions via SpectaclesInteractionKit for intuitive note placement and voice activation
- Shipped in 32 hours, achieving semi-finalist at Hack the North 2025 (top 32 out of 256 teams, 1000+ hackers)

🔗 **FitSage** – AI Fitness Companion with Voice Logging | *TypeScript, Next.js, Supabase, HuggingFace, Gemini API*

- Engineered fitness app reducing workout logging time by 5-10x through voice/text input, consolidating logging, training plans, and AI advice from multiple apps into unified platform
- Developed AI pipeline: Web Speech API transcribes input, HuggingFace pre-processes text, Gemini extracts data from unstructured workout entries and generates personalized suggestions
- Implemented workout curation analyzing recent activities to detect gaps and dynamically generate 10+ tailored exercises
- Constructed dashboard displaying body metrics, intensity charts, and workout history with AI interpretations and advice

🔗 **CheFlow** – Intelligent Recipe & Meal Planning App | *Processing, G4P (GUI Library)*

- Engineered recipe app suggesting meals from available ingredients and time constraints to reduce decision fatigue
- Developed ingredient-matching algorithm using set intersection and scoring to maximize pantry utilization
- Constructed data visualizations (scatter plots, regressions, heatmaps) analyzing cooking habits
- Designed interactive GUI with Processing's G4P library for streamlined recipe entry and meal planning workflows

TECHNICAL SKILLS

Languages: Python, TypeScript/JavaScript, C/C++, SQL, Processing, HTML/CSS

Technologies: React, Next.js, Node.js, Express, FastAPI, Flask, HuggingFace, Tailwind CSS, OpenCV, Pandas, Qt

Development Tools: Git, Docker, Bash, Firebase, PostgreSQL, MongoDB, GCP, Lens Studio, CMake

AWARDS

Canadian Team Math Contest: **3rd Place** Nationally | Euclid Math Contest: **Top 5%** | Canadian Sr. Math Contest: **Top 2%**