

# RICKY TANG

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## EDUCATION

University of Waterloo

2025 – 2029

Honours Bachelor of Software Engineering (Co-op)

## TECHNICAL SKILLS

**Languages:** Python, TypeScript/JavaScript, C++, C, Swift, SQL, Bash, HTML5, CSS3

**Technologies:** React, Next.js, REST APIs, FastAPI, Flask, Node.js, Express, PyTorch, OpenCV, Tailwind CSS, React Native, Pandas

**Development Tools:** Git, Docker, CI/CD, PyTest, Firebase, Supabase, MySQL, PostgreSQL, MongoDB, GCP, Cloudflare, Railway

## PROJECTS

**Tark** – Google Earth for Game Devs | *TypeScript, Next.js, Python, FastAPI, Leaflet, SciPy*

- Developed web app turning locations into game-ready 3D meshes in **<15 seconds** (typically weeks of manual modeling)
- Processed Mapbox elevation and satellite imagery to generate terrain meshes at **45K+ triangulated faces per second**
- Extracted **2000+ building footprints** from OpenStreetMap and generated textured .obj files for Unity/Blender workflows
- Implemented PyProj geographic-to-metric coordinate system supporting **25+ km<sup>2</sup>** areas with **7.5m terrain resolution**

**Auralis** – AI Doctor with Real-Time Video & Emotion Detection | *TypeScript, Next.js, Python, FastAPI, Cloudflare, Railway*

- Created real-time video consultation platform with 3D avatar analyzing patient emotions and speech across **6 age groups**
- Developed emotion detection via face-api.js (**68 facial landmarks**) and VADER sentiment to generate adaptive responses
- Integrated lip-synced avatar using Web Audio API with ElevenLabs speech synthesis and age-specific diagnostics

**Sneuz** – Sleep tracker with Shortcuts + HealthKit Integration | *Swift, TypeScript, Next.js, Supabase*

- Rebuilt iOS deprecated automatic sleep feature using **Shortcuts Automation** and **App Intents** for zero-touch tracking
- Architected event-driven sync between iOS widget, main app, and Next.js analytics dashboard via **Supabase Realtime**
- Achieved **99.8% battery reduction** vs continuous polling trackers by eliminating background accelerometer processes
- Built batch-processing engine for **30+ day retroactive HealthKit sync** in <2s without blocking main thread

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

- Engineered Spectacles lens enabling users to place shared 3D notes in physical locations with spatial persistence
- Built voice-to-3D pipeline using ASR to transcribe speech and Gemini to optimize prompts for 3D object generation
- Generated spatial objects from voice commands via Snap3D, eliminating manual text input in AR environments
- Integrated **10+ gesture interactions** with **5-meter range** for intuitive note placement via SpectaclesInteractionKit

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

- Developed Next.js + FastAPI web app turning **100+ page textbooks** into interactive concept networks in **<20 seconds**
- Engineered processing pipeline generating **200+ concepts** with AI insights and React Force Graph to visualize networks
- Constructed automated study pipeline with PyPDF extraction and ElevenLabs, generating cheatsheets and audio digests
- Containerized with Docker and deployed on GCP, handling **8+ RESTful API endpoints** for scalable concurrent processing

## EXPERIENCE

**Waterloo Aerial Robotics Group (WARG)** | *Python, React, Flask, OpenCV, MAVLink*

Oct. 2025 – Present

Waterloo, ON

Autonomy Software Developer

- Streamlined ground station UI with one-click pause/resume for missions, eliminating manual switching for **50+ operators**
- Reduced mission failure recovery time from 30s+ to 3-5s for command pipeline operations (**85% improvement**)
- Engineered full-stack control pipeline with React frontend, Flask-SocketIO backend, and MAVLink for real-time commands
- Implemented OpenCV object detection in aerial imagery and MAVLink telemetry streaming, achieving **80%+ IoU accuracy**

**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** team through collaborative robotics project, resulting in functional writing automation robot

## AWARDS

- Hack Western 2025: **Best AI Application Built with Cloudflare**
- Hack the North 2025: **Semi-Finalist** (top 32 out of 256 teams, 1000+ hackers)
- Canadian Team Math Contest: **3rd Place** Nationally | Euclid Math Contest: **Top 5%** | Canadian Sr. Math Contest: **Top 2%**