

# RICKY TANG

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## EDUCATION

University of Waterloo Sep. 2025 – Apr. 2029  
*Honours Bachelor of Software Engineering (Co-op)*

## PROJECTS

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

- Built web app turning real-world places into game-ready 3D meshes in **<15 seconds**, replacing weeks of manual modeling
- Processed Mapbox elevation and satellite imagery to generate terrain meshes with **260K-520K triangulated faces**
- 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*

- Built real-time video consultation platform with 3D avatar analyzing patient emotions and speech across **6 age categories**
- 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

### 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 note placement via SpectaclesInteractionKit

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

- Built full-stack application transforming **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

- Built ground station UI with **one-click pause/resume**, eliminating manual mission switching for **50+ drone operators**
- Reduced mission failure recovery time by **85%** through pause/resume vs full restart (3-5s vs 30s+)
- Engineered full-stack control pipeline: React frontend, Flask-SocketIO backend, MAVLink protocol for flight commands
- Implemented OpenCV object detection achieving **80%+ IoU accuracy** in aerial imagery and MAVLink telemetry streaming

### Brick Works Academy

Jun. 2024 – Jul. 2024

Waterloo, ON

Co-op Camp Counselor

- 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

## TECHNICAL SKILLS

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

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

**Development Tools:** Git, Docker, Bash, Firebase, Supabase, PostgreSQL, MongoDB, GCP, Cloudflare, Railway, Lens Studio

## 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%**