

# RICKY TANG

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## EDUCATION

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

## 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

## 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 elevation and satellite imagery to generate terrain meshes with **260K-520K triangulated faces**
- Extracted **2000+ building footprints** and generated textured .obj files optimized for **Unity/Blender**
- Implemented terrain mesh generation with **NumPy/SciPy** smoothing and building extrusion for all complex shapes
- Developed coordinate system using **PyProj** for geographic-to-metric conversion and terrain-building elevation matching

### 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
- Deployed on **Cloudflare Pages** and **Railway**, winning **Best AI Application Built with Cloudflare at HackWestern 2025**

### 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 input 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 via **SpectaclesInteractionKit** with **5-meter interaction range** for note placement
- Shipped in 32 hours, achieving **semi-finalist** at **Hack the North 2025** (top 32 out of 256 teams, 1000+ hackers)

### 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**
- Built processing pipeline using **PyPDF** extraction and **React Force Graph** visualization for network-based learning
- Architected **Firebase** schema enabling real-time traversal of **200+ concepts** with on-demand AI insights
- Constructed automated study pipeline generating cheatsheets and realistic audio digests from LLM scripts via ElevenLabs
- Containerized with **Docker** and deployed on **GCP** for scalable multi-user concurrent processing

## EXPERIENCE

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

Oct. 2025 – Present

*Autonomy Software Developer*

Waterloo, ON

- Built ground station UI with **one-click pause/resume**, eliminating manual drone mission switching for **30+ members**
- Engineered full-stack control pipeline: **React** frontend, **Flask-SocketIO** backend, **MAVLink** protocol for flight commands
- Implemented **OpenCV** object detection in aerial imagery and **MAVLink** workers for telemetry streaming via IPC queues

### 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

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