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++, 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** (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+ km²** 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 intuitive 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

ChessBot – Neural Network Chess Engine | *PyTorch, Python, HuggingFace*
- Trained chess move prediction model achieving **43% accuracy** and **1559 Elo rating** in competition against other bots
- Built **ResNet CNN** with dual heads (**18.5M params**) using residual blocks for move prediction and position evaluation
- Engineered **19-channel** board encoding with piece positions, castling rights, and normalized material advantage
- Processed **30GB Lichess dataset** with **500K positions** from 2300+ Elo games and tactical puzzle specialization

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 for flight 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%**