Reese Chong

r25chong@uwaterloo.ca | linkedin.com/in/reesechong | github.com/r-chong | reesechong.com

Education

University of Waterloo Waterloo, ON

Honours Bachelor of Computer Science (BCS)

UW Reality Labs, Rock Climbing, Socratica

Experience

Embedded Linux Engineer Sept 2025 - Present

UW Reality Labs *Waterloo, ON*

- Writing kernel-level code including a **custom DRM/KMS Linux driver** (MIPI DSI panel, I²C power regulator, backlight).
- Built a DKMS-based on-device build and deployment workflow, reducing driver iteration from **2 hours to <10 mins.**
- Adapted references from open-source display drivers (Northstar, Pi Touch, Dartcom) to design architecture for the specific panel.

Software Engineer Intern Apr 2025 - Aug 2025

ElasticEnergy.com *Victoria, BC*

- Engineered React/TS web dashboard for **10k+** IoT devices using a device-scoped cache, reducing re-renders by 70%.
- Benchmarked worker-accelerated, paginated data tables: **20k rows** with **<200ms** search, 50k rows with ≈ 1s indexing.
- Implemented strict CSP and header middleware to block **100%** of inline scripts, mitigating cross-site scripting (XSS) vectors.
- Enforced secure authentication by integrating AWS Cognito user pools with role-based access control across the dashboard.

Software Engineer Intern May 2024 - Aug 2024

McCray Optical, Inc. *Markham, ON*

- Designed retrieval system for **15k+** vector embeddings of customer inquiries, **cutting support onboarding time by 2 weeks.**
- Achieved accurate, **≈150-250ms** query latency by embedding answers with local models, reranking results with Cohere Rerank.
- Automated email ingestion into **Pandas DataFrames** via vectorized preprocessing and schema normalization for embeddings.

Drone Researcher May 2023 - Aug 2023

University of Toronto Institute for Aerospace Studies - Flight Systems and Control Lab *Vaughan, ON*

- Researched and prototyped quadrotor slung-payload systems, validating stable lift of ≈ **2 kg** through stress/strain analysis.
- Fabricated payload deployment mechanisms via CATIA structural modelling, 3D-printed parts, and Arduino-controlled motors.

Projects

Notes-to-3Blue1Brown-Video Generator | 🔗 | *React, Next.js, TypeScript, Firebase, Google Cloud (GCP)*

- API product that generates visual educational explainer videos, developed for B2B EdTech partners.
- Reduced inference cost from **$0.20 to <$0.10** per request by fine-tuning and optimizing Groq inference models.
- Curated a custom dataset of **5k+ Manim files**, implementing stratified cross-validation with calibration for model training.

ML YouTube Filter Chrome Extension | 🐙 | *Python, TensorFlow, Snorkel, Chrome Extension API*

- Trained a **logistic regression model** on YouTube metadata detecting educational videos with **91% precision**, **87% recall**.
- Engineered selective classification with calibrated thresholds, optimizing precision to **94**% while maintaining 76% coverage.
- Reduced regression detection time from **1h to <5 minutes** in CI by implementing a testing framework using headless browsers.

Textbook-to-Embeddings Learning Platform | 🐙 | 🔗 | *Python, Postgres, Docker, SQLAlchemy*

- Flashcard app ingesting **1000+ page PDFs** with OCR pipelines and a knowledge-graph layer linking new topics to old topics.
- Scaled ingestion to **<2s** for ≈ **750k token documents** with **95%** parsing accuracy allowing downstream search with PGVector.
- Engineered efficient document embedding and storage architecture to minimize cloud storage costs.

ChatGP-Me (Winner of Hack The North 2024) | 🔗 | *Unity, Cohere API, C#*

- Unity game where you pretend to be ChatGPT, and AI grades how artificial you sound. One of 12 winners out of **236 teams**.
- Designed prompt chains (e.g., scoring tone, coherence, and LLM-likeliness separately) with reranking heuristics to grade players.
- Implemented feedback system that helps players progressively improve their ability to mimic AI-generated responses.

Hawkeye Vision Aid (Winner of Hack The North 2023) | 🔗 | *Python, Google Cloud Vision*

- Smart glasses software to assist visually impaired students, achieving **92% OCR accuracy** on lecture whiteboards.
- Applied Vision, NLP models for summaries, streaming descriptions with **<500 ms** latency and **>90%** transcription accuracy.

Skills

Languages/Frameworks: Python, TypeScript, JavaScript, React, React Native, SQL, C/C++, Java, Racket/Scheme, Bash
Frameworks: React.js, Next.js, FastAPI, sklearn, PyTorch, SQLAlchemy, LangChain, Tailwind
Technologies: Git, Docker, PostgreSQL, Supabase, AWS, GCP, ChromaDB, Unity, Postman