Johnnie Tse

B. A. Sc (Computer Engineering) Candidate
Queen's University (Seeking 2026 Summer Internship)

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EDUCATION

• Queen's University, Kingston, Ontario   *2022 - 2027*
Bachelor of Applied Science (BASc) in Computer Engineering

PROFESSIONAL EMPLOYMENT EXPERIENCE

• Freelancer.com   *May 2024 - August 2024*
Android App Development Freelancer   Remote
– Built a feature-rich proof-of-concept e-commerce Android application for my client's brand, **ChillnCharm,** from concept to delivery using **Kotlin**, **MVVM Clean Architecture**, and **Repository pattern,** creating a modular codebase that reduced future development time by an estimated 20%.
– Integrated **Retrofit** for accessing the **FAKE STORE API** and **ROOM Database** for local caching, achieving an **85% faster content load time** for cached content compared to API calls and enabling offline functionality.
– Developed and designed an intuitive UI/UX in **Android Jetpack Compose** (or **XML** if applicable) based on high-fidelity **Figma prototypes** that enhanced users' shopping experience, facilitating features like multi-category browsing, wishlist, and a shopping cart.
– Managed full project lifecycle and client collaboration using **Agile methodologies**, delivering the complete prototype on schedule & adapting to evolving client requirements.

• Foresoon Computer Engineering Company Limited   *August 2023 - September 2023*
Electrical & Robotics Engineer Assistant   Hong Kong SAR
– **Engineered a real-time computer vision pipeline** using Python and OpenCV with depth segmentation and ArUco marker tracking to estimate 3D poses, enabling a **Kinova Gen3 6-DOF arm** to guide its end-effector with **sub-centimeter accuracy** for a robotic feeding system.
– **Co-developed a modular ROS-based state machine** to orchestrate an autonomous assistive feeding workflow on a **Clearpath Jackal UGV**, integrating **Cartesian impedance control** for force-limited, compliant manipulation and ensuring safe physical interaction with users.
– **Designed and prototyped** a compliant spoon end-effector using **SolidWorks and FDM 3D printing**, applying **DFM/DFA principles** to minimize assembly parts and maximize user safety during force-limited physical interaction.
– **Leveraged industry-standard tools** (Foxglove, rqt) for real-time visualization and data logging, **reducing system debugging and iteration time by an estimated 30%** during component-level and end-to-end autonomous trials.

• Arista Networks   *May 2023 - August 2023*
Project Financial Management Intern   Hong Kong SAR
– **Modeled financial viability** for a **$2M portfolio** of client pilot and internal automation projects using advanced Excel (NPV, XIRR, ROI, Goal Seek) to evaluate network upgrade, software development, and data center expansion initiatives; analysis directly supported executive decision-making, leading to the prioritization of **3 high-ROI automation pilot projects** and the deferral of low-impact initiatives.
– **Conducted monthly budget variance analysis** for **6 active projects** in SAP S/4HANA, identifying and investigating **$150K+ in potential cost overruns**; partnered with Project Managers to pinpoint root causes and develop mitigation strategies, preventing last-minute budget cuts and ensuring project financial health.
– **Engineered a Power Automate workflow** integrated with SharePoint Dataverse to automate a legacy, manual data collection process for financial reporting; the solution **reduced manual effort by 15+ hours per week** and **improved report turnaround time by 20%**, accelerating monthly financial close cycles.
– **Developed an interactive Power BI dashboard** to synthesize fragmented Excel data into visual insights on project performance; the tool empowered PMs to **identify $75K in cost variances** between project proposals and execute resource reallocation, **boosting per-project efficiency by approximately 25%**.
– Implemented and managed **Jira** to track project deliverables using a **Scrum framework** to consolidate tracking from 3 prior sources of information (**SAP S/4HANA, Excel spreadsheets, and SharePoint lists**) into a single source of truth; enhancing cross-functional visibility and coordination between finance and engineering teams.

EXTRACURRICULAR ACTIVITIES

• Queen's AutoDrive Team   *August 2025 - Current*
Embedded Systems Engineer   Kingston, ON
– Engineered a multi-threaded C++ ROS2 node to transmit and decode CAN 2.0b messages over a **dual-channel automotive CAN bus**, implementing ISO-TP diagnostic protocols for real-time data exchange and control of key vehicle subsystems, including propulsion, steering, and braking.
– Developed and validated message integrity mechanisms for safety-critical CAN messages related to torque, braking, and steering in accordance with industry automotive safety and communication standards and specifications, ensuring 100% data integrity and zero fault codes during autonomous operation.
– Integrated a MATLAB Stateflow model into the ROS2 stack, creating a state machine that orchestrates the autonomous startup sequence, manages driver override detection, and ensures safe disengagement, supporting advanced autonomous vehicle functionality aligned with SAE Level-4 objectives.
– Designed, built, validated, and deployed a custom CAN harness supporting multiple bus topologies, including high-speed and single-wire networks, enabling reliable communication for all subsystems. For instance, we resolved signal integrity issues through resolving signal integrity issues through proper bus termination and integration of CAN adapters for single-wire communication.
– Authored comprehensive technical documentation, including system architecture diagrams, protocol implementation guides, and test validation procedures, facilitating knowledge transfer for a team of **6 engineers** and ensuring readiness for formal SAE design reviews.

• Engineering Society of Queen's University   *March 2025 - Current*
Sci '26 Vice-President   Kingston, ON
– **Co-led** a 12-member executive team to strategize, plan, and execute **10+ large-scale events** (social, academic, networking) for **800+ students** in the Class of 2026, enhancing student engagement and community building.
– **Represented** the class of 800+ students as a voting member on the Engineering Society Council, advocating for student interests in governance decisions impacting the **3,000+ engineering student body**.
– **Championed** student advocacy initiatives, including policy proposals and feedback forums, directly influencing faculty-level academic and policy decisions to align with student needs.
– **Served** as the primary liaison between student body, faculty, and university administration, negotiating resources and collaboration opportunities that improved academic support services for first-year engineers.
– **Championed** 3+ student-led policy initiatives from conception to presentation, resulting in the successful adoption of new academic accommodations and wellness resources.

• Queen's High-Performance Computing Club   *December 2023 - Current*
Co-Founder, Sponsorships Lead, and Financial Lead   Kingston, ON
– **Spearheaded** the founding and strategic development of the university's first HPC club along with other two co-founders of the club, establishing a **sprint-based training framework** for **40+ members** that prepared the team for **international Student Cluster Competitions (SCC)**, including the **SC26**.
– **Prepared and delivered 5+ technical workshops** on HPC fundamentals (Linux, MPI/OpenMP, Slurm, HPL/HPCG), resulting in **50+ hours of training** and increasing member competency in cluster administration and performance benchmarking.
– **Developed** an Android expense-tracking application to automate financial reporting, **reducing manual reconciliation time by 25%** and streamlining budget management for competition travel. (https://github.com/johnnietse/travelExpenseTracker.git)
– **Optimized cluster performance** by applying advanced techniques in parallel processing, shell scripting, and power management, directly contributing to the team's readiness for competition scenarios.
– **Translated complex HPC research** into **10+ accessible presentations** on applications like LAMMPS and Phasta, onboarding **100% of first-year members** and building foundational knowledge.

PROJECTS

• Mini RISC-V Softcore platform for FPGA designs *(Verilog, Quartus II, Intel ModelSim Altera, Cyclone V FPGA)* *January 2025 – May 2025*

Coursework Project

– Constructed a **virtual 32-bit softcore computer** that uses **RISC-V Instruction Set Architecture** using **Verilog & Quartus II**, and tested on **Modelsim Altera**
– Prepared for **hardware implementation** on a **Cyclone V 5CEBA4F23C7** device; simulated with **34,481 logical elements**, **32 registers**, and **168 pins**; theoretical operation up to **500 MHz** and average cycle per instruction of **12.29 CPI**.

• AI-Powered Job Application Assistant (ApplicaAI) *(LangGraph, Google Gemini 1.5 Flash, SerpAPI, Python)* *August 2025 – Present*

– Engineered a full-stack AI application using **LangGraph**, **Google Gemini 1.5 Flash, and LLM context injection** to automate and optimize the job search process, reducing application preparation time by **90%** and creating a scalable, multi-step orchestration pipeline.
– Developed an **ATS Optimization Engine** that simulates recruiter screening software, analyzing resume-job description fit to provide a compatibility score and keyword analysis, increasing the likelihood of application visibility.
– Integrated **SerpAPI** with a multi-step AI workflow to perform real-time company research, scraping, and synthesizing data from Google Search to deliver actionable insights on company culture and metrics.
– Architected a robust backend with a **LangGraph state machine** to manage a complex, multi-step orchestration pipeline for resume parsing, analysis, and content generation, ensuring reliability and scalability.

TECHNICAL SKILLS & INTERESTS (PUT THIS AT THE BEGINNING IF NEEDED)

Languages: Java, Kotlin, C, C++, Embedded C++, Python, Verilog, VHDL, HTML, CSS, SQL, R, Bash/Shell, Assembly language, JavaScript, LaTeX, Tailwind CSS
Libraries & Modules: Standard Java, Python, and C Libraries, Python Open CV, NumPy, and C POSIX Libraries, Linux Kernel Modules
Frameworks, Platforms, and Methodologies: React.js, Node.js, Next.js, Express.js, Arduino, Flutter, ROS2, Android Jetpack Components, CI/CD Pipelines, Agile/Scrum Methodologies
Modelling & Simulation Tools: AutoCAD, SolidWorks, Fritzing, KiCAD, LTSpice, CPUlator, Intel Quartus Prime, Intel ModelSim, MATLAB
Productivity Software & Business Tools: Microsoft Office (Excel, Word, PowerPoint, Project, Teams, SharePoint), Microsoft Power BI, Microsoft Power Automate, Cloudflare, Foxglove, rqt
Databases & Cloud Services: Relational Database (MySQL, Oracle), SAP S/4HANA Cloud, Google Cloud Platform, MongoDB, AWS Fargate
Embedded Systems & Hardware: FPGA Development (RISC CPU, Traffic Light Controller), Raspberry Pi, Arduino, Linux Device Drivers, SELinux, CAN Bus, ECU Systems, V2X/V2V Communication, Signal Processing, Sensor Calibration & Motor Control, PCB Design (KiCAD, Fritzing), Soldering & Circuit Prototyping
Relevant Coursework: Computer Architecture, Electronics I, Digital Systems Engineering, Data Structures & Algorithms, Object-Oriented Programming, Data Science, Microprocessors & Embedded Systems, Operating Systems, Economic and Business Practice, Computer Networks, Cryptography & Network Security, Artificial Intelligence, Machine Learning & Deep Learning with Computer Vision, Probability & Random Processes, Database Management Systems, Software Specifications, Information Structures, Engineering Client-based Design Project, Computer Engineering Capstone Project, Algorithms Engineering Applications, Discrete Mathematics, Ordinary Differential Equations
AI/ML & Web Development: LangGraph, LangChain, LLM Integration (Google Gemini API, Claude API, ChatGPT API), LLM Injection, Prompt Engineering, Context Injection, Retrieval-Augmented Generation (RAG), Transformer Models, Computer Vision (OpenCV), RESTful API Design & Integration
Languages spoken: Native in English, Mandarin, and Cantonese and Limited working proficiency in French