Nicholas Chen

n224chen@uwaterloo.ca | linkedin/in/nicholaschen | github.com/nicholaschen09 | mypersonal-website | (647) 639-9446

Education

University of Waterloo **Expected Graduation Date: April 2029**

Bachelor of Applied Science in Systems Design Engineering *Waterloo, Ontario*

- President's Scholarship of Distinction worth **$5000**
- Relevant Courses: Introduction to Design, Digital Computation, Elementary Engineering Math, Data Structures and Algorithms

Technical Skills

Languages: Python, Java, C++, HTML/CSS, JavaScript, TypeScript, Kotlin, SQL, MATLAB, Bash, Scala

Developer/Design Tools: VS Code, Android Studio, Postico, Jupyter Notebook, Git, GitHub, Docker, Heroku, AWS, Azure, CircleCI, Kubernetes, ChatGPT, Claude, Copilot, Cursor, Figma, SOLIDWORKS, AutoCAD, Apache Airflow, Dbt

Technologies/Frameworks: React, React Native, Node.js, Express.js, Nest.js, Supabase, Firebase, Flask, PostgreSQL, MongoDB, Redis, RabbitMQ, GraphQL, Jest, PyTorch, TensorFlow, Numpy, Pandas, REST APIs, Puppeteer, Tailwind CSS, Apache Spark, Kafka, Hadoop, Snowflake, Google BigQuery, Databricks, Delta Lake, Parquet

Experience

Royal Bank of Canada (RBCx) - Ownr **January 2025 – April 2025**

Software Engineer Intern *Toronto, Ontario*

- Contributed to scaling and building 6+ full-stack web apps using **React**, **Nest.js**, and **TypeScript**, to support **200,000+ users**.
- Reduced query response time by **30%** by optimizing **PostgreSQL** queries across **200K+ entries**, boosting load speed.
- Achieved **99.9% uptime** by writing **40+ unit and integration tests** using **Jest**, **Supertest**, and **Puppeteer**.
- Improved deployment speed by **40%** by implementing **CI/CD** pipelines with **GitHub Actions**, **CircleCI**, and **Docker**.
- Increased system throughput by **25%** using **Redis** for caching and **RabbitMQ** for message queueing in microservices.
- Contributed **1000+ commits** and **35+ pull requests** across services, following rigorous code review and CI practices.
- Deployed scalable services across **6+ pods** using **Kubernetes**, improving fault tolerance and horizontal scalability.
- Enabled projected **$15,000+ annual savings** by optimizing backend performance and reducing server resource usage.

Royal Bank of Canada **July 2024 – August 2024**

Software Engineer Intern *Toronto, Ontario*

- Developed a **time series forecasting machine learning model** using **linear regression** in **Python** with **NumPy** and **Pandas** to predict the volume of monthly sign-ins, enabling **95%** better resource allocation within the support team.
- Reduced support team work times by **30%** by accurately forecasting when **2 million** customers would bank online.
- Identified potential cost savings of over **$50,000** annually by predicting and preemptively managing peak support periods, reducing the need for overtime and additional resources.
- Built interactive data visualizations with **Plotly** to communicate model insights to non-technical stakeholders.

University of Waterloo Alternative Fuels Team **September 2024 – December 2024**

Software Engineer *Waterloo, Ontario*

- Designed hybrid energy management strategies for a plug-in hydrogen FCEV, improving fuel efficiency by **12%**.
- Simulated vehicle dynamics using **MATLAB/Simulink** across **200+ drive cycles** to validate control logic.
- Integrated real-time embedded control systems with a 15+ engineer team, reducing energy losses by **30%**.

Projects

Customer Feedback ETL Pipeline — *Python, Pandas, TextBlob, SQLAlchemy, PostgreSQL, Streamlit* **April 2025**

- Developed an end-to-end ETL pipeline to extract customer feedback from CSV files using **TextBlob**.
- Processed **900+ feedback entries**, achieving **92% sentiment accuracy** by labeling as positive, neutral, or negative.
- Loaded transformed data into a **PostgreSQL** database using **SQLAlchemy** for better and quick access.
- Implemented data cleaning procedures, including handling missing values and removing duplicates, to ensure data quality.

Fernando — 2nd Place @ Utra Hacks | *C++, Python, OpenCV, Arduino, CAD, Terraform, MongoDB* **January 2025**

- Built **Fernando**, a real-time posture-checking robot using **OpenCV** (**95% accuracy**) and **Arduino**-controlled servos.
- Programmed vision in **Python** for posture analysis and motor control in **C++** to adjust user posture dynamically.
- Developed a database website with **Terraform**, tracking **100+ sessions** and generating personalized analytics.
- Engineered a data pipeline to process and store posture metrics using **Python**, **SQL**, and **MongoDB**, enabling real-time analytics.

BasketBin — @ Hack the 6ix | *Python, Flask, Supabase, OpenCV, Arduino, Servo Motors* **August 2024**

- Developed **BasketBin**, an interactive game that rewards users for sorting trash and recycling correctly.
- Achieved **90% classification accuracy** using **OpenCV** and webcam-based real-time waste analysis.
- Automated sorting mechanisms using **Arduino**-controlled servo motors and sensors, enabling **100+ waste items/hour**.
- Built a **Flask** app with **Supabase**, supporting user authentication, score tracking, and a live leaderboard for **50+ users**.