

# David Chen

Software & Security Developer

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## Education/Certifications

**Honors Bachelor of Computer Science & Statistics**

University of Toronto

Sep. 2024 - Dec 2028

Toronto, ON

**CompTIA A+, CompTIA Security+**

Obtained Aug 2024, 2025

## Work Experience

**Computer Science Instructor**

RoboEDU

Aug 2022 - Sep 2023

Toronto, ON

- **Taught Python, C, Lua and Robotics:** With interactive exercises and tutorial work for 30+ students. Fostered a inquiry-first teaching methodology for software and hardware design.
- **Led a Junior Robotics Team:** Acting as a mentor during the engineering process. Established tests for consistency and stability aswell as routine code audits.
- **Developed Neural Networks and Computer Vision Projects:** Guiding 5 students through the process of developing with Tensorflow and Sklearn.

**DevSecOps Intern**

Pathway Communications

Mar 2023 - Jun 2023

Toronto, ON

- Developed scripts to meet NIST benchmarks that update expired certificates, old passwords and unused ports for use in **110+** firewalls and routers.
- Integrated **Elastic Search & EDR** into company ecosystem using **EC2** cloud servers with production-equivalent environments from IaC. Designed tests to validate EDR capabilities.
- Kept organizational knowledge base up-to-date with threat feeds, TTP and malware indicators.

## Extracurricular Roles

**CTF Team Captain** | BYTE-BABIES CTF

Dec 2023 - Present

- Ranked **3rd in Canada** scoring high in **30+** international CTF events.
- Published in-depth reference for reversing ELF, PE, Android, Golang and Python. Effective for solving **50+** unique challenges.
- Developed custom virtual machines, C2 servers, constraint solvers and encryption libraries.

**Training Lead** | UofTCTF

Sep 2025 - Present

- Taught high level **reverse engineering** techniques in deobfuscation, symbolic execution, malware behavior and compiler fundamentals to new members.
- Developed interactive **AI redteaming** workshop that teaches data poisoning, prompt injections, byzantine attacks, model extraction and interpretability-based evasion.

**Director of Technology** CSEC - UofT

Sep 2024 - Present

- Designing **C-like interpreter** designed with **LLVM** backend with support for **first-class** and **higher-order functions**.
- Presented seminars on **ReactJS** fundamentals and the **JSX** transpilation engine for **20+** students.

**Research Lead** | Epidemic Research Group

Dec 2024 - July 2025

- **Winner of Research Bunny 2025 Grant**
- Fitted and Fine-tuned XGBoost classifier retrained with Optuna, Holt-Winters encoding and 7-day lag to achieve a **90% capture of variance**.
- Filtered features by using **Exploratory Data Analysis** in univariate and bivariate analysis to cancel out redundant or skewed variables from public sources.

**Web Scraper Lead** C.R.E.A.T.E - UofT | Python, Flask, BeautifulSoup

Sep 2024 - Present

- **Created a News Crawler:** Periodically parses 5 news outlets. Done by establishing bi-weekly meetings for group members to work out project requirements.

- **Led Webscraper, PostgreSQL and AWS Tutorial sessions:** Teaching many novice programmers how to setup development environments and use cloud services by example.

**Design Club Executive** Design@Bethune | *Linux, 3D Design* Sep 2023 - Jun 2024

- **Led 7+ Workshops:** On linux, game design, 3D printing, woodworking and graphic design.
- **Established Partnerships Between Art Club:** Allowing for our collaborative sticker printing and graphic design workshops.
- **Managed Club Administration:** By developing budgets and recording existing club resources for future workshops months in advance.

## Technical Skills

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**Languages:** Go, Rust, Typescript/Javascript, C/C++, Python, Ruby, Java, Lua, Nix, Solidity, SQL, Haskell, Lisp, Verilog, VHDL, Powershell, Bash

**Frameworks & Libraries:** React.js, Next.js, Express.js, FastAPI, Tensorflow, QT, Langchain, Android

**Databases & Cloud:** AWS (EC2, Lambda, S3), GCP (GKE, Gemini, Gmail, Maps), Elastic, Firebase, PostgreSQL, MySQL, Redis, MongoDB, Prisma, Nginx

**Tools & Concepts:** Docker, Git, UNIX/Linux, QEMU, Visual Studio, Vim, VMWare, Kicad, OOP, FP, SDLC, SOLID, Agile, REST, PKI, OWASP 10, TCP/IP, FPGA

## Projects

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**PuzzleQL** | *PostgreSQL, ReactJS, FastAPI* HackThe6ix 2025

- Developed web-based **SQL transpiler** using a block-based scratch-like design for converting visual code into raw SQL queries. Done by implementing a **BNF grammar** to allow for **recursive descent parsing** into node structures.
- Provided SQL interfaces in **FastAPI** designed to sanitize and forward CRUD requests to user-owned **Postgres** databases.

**Proxmox Homelab** | *Proxmox, LXC, Docker, Bash, CRON*

- Serving **FOSS** services to **3K+ daily visitors**.
- Hardened homelab security through **microservice containerization**, restricting open services via **reverse proxy**, **firewall policies**, **Cloudflare tunnels** and setting up an **internal VPN**.

**Geminaut Browser** | *Go, ReactJS, Electron, TailwindCSS*

- Implemented **parser** and **renderer** for the GEMINI Internet Protocol In **Golang**, creating APIs to parse page data into a json representation of the **DOM**.
- Developed frontend in **Electron**, **Tailwind**, **ShadCN** complete with caching, tabbing, history and page rendering implemented via **ReactJS** hooks, allowing for greatly improved UX.

**PhishNet.work** | *AWS, ReactJS, NextJS, Twilio, SageMaker* UoftHacks 12 2025

- **Built off Twilio API:** Making endpoints for outbound and inbound calls to be recieved and serialized for text interpreting.
- **Configured AWS Ecosystem:** With EC2 server setup, firewall rules and webhooks to connect Twilio and Sagemaker.
- **Setup Transcription to Scam Detection Pipeline:** By converting muVal audio data into text and then passing it into BERT classificaton for phishing weight.
- <https://dorahacks.io/buidl/21620>

**Split Ergo Keyboard** | *KiCAD, CAD, 3D, PCB, Soldering*

- Modified **KiCAD** PCB traces for custom Corne keyboard with LED and **microcontroller** support.
- Developed custom firmware to control keys, OLED screen, macros and layers using **QMK** and **C**
- Designed 3D Case in **Blender** and assembled PCB, diodes, OLED, LED, GPIO pins, debug ports.

**ZYNQ FPGA** | *FPGA, Verilog*

- Designed **FSM** for Multiplier, LED Controller and ALU with corresponding **System Verilog** descriptions and constraints files.
- Synthesized programs using **Vivado** to control GPIO, switches, LEDs and buttons.

**Data Dam** | *ReactJS, Flask, Google Maps, Open-Meteo, IWLS, Sklearn* CTRL+HACK+DEL 2024

- **Data-mining of Historical Climate Data:** By curating and sanitizing 2 online datasets used for training in the forest classification ML model for stream intensity.
- **Integrated Location APIs:** With Google maps. Open-Meteo and IWLS APIs to measure local temperature, humidity and water-levels from a user's IP address.
- <https://devpost.com/software/data-dam>

**Room.IT** | *AWS, ReactJS, NextJS, NodeJS* Hack The Student Life 2024

- **Deployed with AWS Amplify:** Used it to monitor API requests with AWS's API gateway.
- **Setup API Endpoints:** With NextJS to interface PrismaDB with custom defined CRUD operations.
- <https://devpost.com/software/room-it-zjpel6>

**Scan2Donate** | *React, Flask, OpenCV, YOLO, PSQL, Openstreetmaps* Hack The Valley 2024

- **Trained an Object-Detection Neural Network:** Using YOLO for detecting 20+ food items.
- **Setup Backend APIs:** For IP to location-finding and interfaces for between Flask and ReactJS.
- **Designed Scalable PostgreSQL Schema:** With automatic API calls to maintain entries.
- <https://devpost.com/software/scanforgood>

**EcoNom-y** | *PostgreSQL, Streamlit, Flask, Gemini* Terrahacks 2024

- **Created PostgreSQL Database:** With APIs for interface designed to query a large database of recipe data at low latency.
- **Developed APIs for Computer Vision and NLP resources:** Allowing for input results to be rendered naturally for the frontend application.
- **Workshopped and Designed the Front-End:** Created in Streamlit with templates for displaying recipes.
- <https://devpost.com/software/econom-y>

**Indigenous Archive** | *Java, Jsoup, Processing*

- **Created a Fast Java Webscraper:** Which periodically parses Imgur and Pinterest for cultural art.
- **Integrated Internet Archive API:** For periodic archival of scraped images.
- <https://github.com/digitalyoshixi/indigenous-archive-test>

**Winter Ocean** | *Python, Pygame, Git* Bearhacks 2020

- **Created a World Generation Algorithm:** Using random noise for replayability.
- **Applied Linear Algebra:** For manipulated input vectors to achieve natural and precise character movement.
- Final project was praised for being highly addictive.
- <https://replit.com/@DavidChen98/hackingthon-ioindian-ocean-game>

## Contests

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**DS3 Datathon 2025** | *Tensorflow, Data Mining, Machine Learning, OpenCV*

- **Ranked 8/27**
- **Preprocessed and feature engineered** by removing biased and similar features while engineering shared features. Removed image impurities like bad crops and noise.
- **Extracted key features** via OpenCV Filters, ORB detection, Canny Edge detection and SIFT matching allowing for 23% valid spore identification rate.