

Technical Skills

- Programming Languages: **JavaScript**, TypeScript, Python, C/C++, C#, Java, Golang,
- Web Technologies: **React.js**, HTML5, CSS, Node.js, **Ant Design**, moment.js
- Game Development: **Unity**, **Unreal Engine**, SDL
- Database & Tools: **MongoDB**, **SQL**, Git, VS Code, Visual Studio
- Security & Infra Tools: Scapy, GDB, Wireshark, Vagrant, Metasploit, Terraform, **AWS CLI**

Technical Experience

JavaScript Developer Co-op

Semios

Jan 2022 – Aug 2022

- Built and maintained **React** components following **Agile** methodologies, ensuring consistent delivery quality.
- Built reusable UI components using **Ant Design** library, implementing features like **data tables**, forms, and **interactive map interfaces**.
- Resolved front-end bugs and implemented UI/UX improvements through effective collaboration with **QA team**.
- Enhanced application functionality by implementing robust **form validation**, content sorting, and date/time management using **moment.js**.

Web Developer

Bluvec Technologies Inc.

Sep 2021 – Dec 2021

- Developed company's landing page using **React**, ensuring responsive design and brand consistency.
- Implemented automated testing suite using **Golang** to improve code reliability.
- Built automated image management system using **GoCV** for timestamp processing and file cleanup.

Technical Projects

TCP Network Attack Simulation

Python, Scapy, Vagrant, GDB

April 2025

- Simulated and evaluated **TCP-layer attacks** in a 3-node virtual network using Vagrant.
- Launched a **TCP SYN flood** to exhaust server backlog and observed mitigation via SYN cookies.
- Executed a **TCP RST injection** to forcibly terminate active Telnet/SSH sessions.
- Crafted spoofed packets to **hijack Telnet sessions**, inject shell commands, and validate impact via packet capture and file system changes.

ROP Exploitation

C, Python, GDB, ROPgadget

Mar 2025

- Developed and tested **ROP chains** against a custom x64 Linux binary with **NX protection enabled and ASLR disabled**.
- Used **GDB and ROPgadget** to locate gadgets and construct precise exploit payloads, including handling register constraints and gadget chaining.
- Wrote Python scripts to automate ROP payload generation and gadget chaining using offsets from libc.

PrediQL

Python, GraphQL, Ollama

Sep 2024 – Dec 2024

- Developed an AI-assisted fuzzing pipeline targeting **GraphQL endpoint vulnerabilities** such as **SQL Injection**, **DoS**, and **batching attacks**.
- Designed Python scripts to automate **LLaMA-based query generation** via **Ollama**.
- Converted LLaMA outputs into structured JSON payloads and used them to test GraphQL APIs, iteratively refining queries based on error responses.

- Bluetooth Cryptographic Protocols** Python Sep 2024 – Dec 2024
- **BLE Pairing Simulation:** Implemented the Just Works pairing method, validating implementation using Bluetooth specification samples.
 - **Legacy Pairing Analysis:** Simulated the Passkey Entry pairing process, exposed vulnerabilities via a **brute force attack**.
 - **Bluetooth Mesh Provisioning:** Implemented provisioning protocols for secure network key distribution and designed advanced attacks, including a **reflection attack** and a **malleable commitment attack** based on research findings, to exploit vulnerabilities.

- Cloud Infrastructure Deployment** EC2, VPC, IAM, DynamoDB Nov 2024
- Deployed a secure VPC network on AWS using the web console, including **public/private subnets, Internet Gateway, NAT Gateway, Route Tables, and Security Groups**.
 - Launched **EC2 instances** and configured a **Node.js web server** accessible on port 8081.
 - Created and managed **IAM users, groups, and roles**, applying the principle of least privilege.
 - Built a **DynamoDB** table and securely connected it to EC2 via role-based permissions.
 - Implemented **Elastic IPs** and studied their behavior on instance restarts.

- Automation with Terraform** EC2, VPC, IAM, Terraform Nov 2024
- Created the cloud infrastructure using **Terraform**
 - Defined and provisioned VPC, subnets (public/private), Internet Gateway, **NAT Gateway, Route tables and Security Groups with custom rules**.
 - Used **Terraform Data Sources** to fetch AMIs and deployed EC2 instances in different subnets with appropriate access levels.
 - Validated connectivity using **SSH jump** host and tested internet access configurations from private subnet instances.

- Serverless API Development** AWS Lambda Nov 2024
- Built a **serverless REST API** using **AWS Lambda** and **API Gateway**, eliminating the need for EC2 servers.
 - Developed a **Lambda function** to support both **GET and POST** requests for a comment system.
 - Secured the **POST** endpoint via **AWS Cognito**, implementing **JWT-based authorization**.
 - Validated API with Postman, tested user-based access control, and discussed **JWT tamper-resistance mechanisms**.

- Eggly Buddy** C++, OpenGL, ECS Framework Sep 2023 – Dec 2023
- Programmed interactive elements using **C++**, enabling in-game pet mechanics and mini-games.
 - Implemented visual effects using custom shaders, including dynamic parallax background and animations.
 - Developed save/load system using **nlohmann/json** library for persistent game state.

- Swag the North** Unity, C# Sep 2023
- **Top 12 Finalist** out of 200+ projects in Hack the North.
 - Spearheaded development of an immersive game using **Unity** and **C#**, featuring innovative swag collection mechanics.
 - Implemented core gameplay systems including player controls, item spawning, and scene management.
 - Led version control workflow and mentored team members in Git best practices.

- Locative Audio** Unity, C# Jan 2023 – Apr 2023
- Developed a **GPS-based** mobile app that lets users discover Vancouver's cultural audio content at specific locations.
 - Built an efficient content management system using **XML** data structure and integrated **AR Foundation** for image detection.
 - Created an interactive map interface with **iGUI** featuring custom camera controls and smooth user navigation.

- FREN** React, JavaScript, MongoDB, Express, Redux Jun 2021 – Aug 2021
- Built a social networking app with **user recommendation system** and **real-time chat** functionality.
 - Implemented **Redux** state management and routing for seamless user experience.
 - Developed responsive chat interface with **custom pop-up components** for friend recommendations.

Education

- Vancouver, BC** Simon Fraser University Sep 2024 – Present
- Master's in Professional Computer Science (Focus: **Cybersecurity**)

- Vancouver, BC** University of British Columbia Sep 2018 – May 2024
- Graduated with a BS in Computer Science, **with Distinction**