Marius Shepherd

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Education

University of British Columbia Sept 2022 - April 2027
Bachelor of Science, Combined Major in Computer Science and Mathematics *Vancouver, BC*

- Dean's Honour List | GPA: 3.90/4.00 | UBC Subbots | UBC CTF Team

Technical Skills

Programming Languages: C, C++, ARMv8, Java, Python, Swift, Julia, Typescript, Flutter, HTML, CSS, ARMv8
Tools: Git, GitHub, Azure, Docker, Nessus, TLS, JIRA, OAuth, Gazebo
Libraries/Frameworks: MLFLow, PyTorch, OpenCV, Keras, ROS2, React, Bluetooth, Numpy, Pandas, Matplotlib

Work Experience

Software and Security Engineer Intern May 2025 - Sept 2025
NTT R&D *Tokyo, Japan*

- Member of the Network Innovation Center project, researching and developing IDS leveraging Linux system calls for NTT subsidiary cloud infrastructure
- Individually engineered two intrusion detection systems, capable of detecting 14 out of 15 simulated attacks ranging such as ShellShock, DirtyCow, HeartBleed
- Achieved 100% detection rate in 11 scenarios, and under 10% false alarm, improving a maximum of 140% by utilizing system call n-grams and argument values in kl-divergence, length and tokenization
- Leveraged shell scripts, Docker, Metasploit, sqlmap, exploitdb, Sysdig to create an efficient penetration testing environment for 10 different proposed intrusion detection systems
- Streamlined training and testing of LSTM, autoencoder models utilizing Python multi-processing, and optimized n-gram size, shared memory, IPC to limit overhead, and integrated MLFlow, Keras, OpenCV, Tensorflow

Software Engineer Intern Jan 2024 - Aug 2024
Cyberium Group *Vancouver, BC*

- Led the end-to-end development of a multi-platform Flutter app for a Bluetooth health device, driving seamless user interaction, hardware communication and data visualization
- Efficiently integrated native Kotlin and Swift BLE GATT and bluetooth functionalities into Flutter UI using method/event channels and MVVM pattern, ensuring smooth synchronization
- Streamlined development by architecting a CI/CD pipeline with Docker Compose on Azure Web Services, ensuring efficient deployment and scaling, , along with OAuth integration
- Utilizing Socket.io on Azure for seamless communication, optimized to handle and scale efficiently with over 400 concurrent client connections with minimal latency, performing load testing with Artillery YAML scripts

Undergraduate Teaching Assistant May 2024 – May 2025
University of British Columbia *Vancouver, BC*

- Programmed assessments relating to CPU pipelining optimizations, virtual memory and physical memory, C programming, filesystems (ext), and assembly translation (ARMv8, RISC-V), distributed to over 400 students
- Engineered extensive autograder test suites for student code that assess memory bugs, multi-threading, and assembly translation in C, with a emphasis on speed and reduced server load

Projects and Extracurriculars

Firmware Developer Sept 2024 – Current
UBC Subbots *Vancouver, BC*

- Led the embedded software team reaching, semi-finals and achieving best performance in team history with limited funding in RoboSub 2025
- Generated 100% autonomous gate & buoy navigation program with ROS2 with C++, leveraging a combination of PID controller, gate detection CV, waypoint generation, and thruster allocation
- Engineered state estimation by leveraging Kalman filters, and creating a Ubuntu ROS2 driver for BNO085 optimizing configuration parameters for stable and accurate underwater state estimation
- Developed a realistic underwater simulation in Gazebo by designing robot models (SDF), configuring environment objects, and implementing buoyancy and IMU sensor models to enable accurate robotic testing