

Colin Byrne

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WORK EXPERIENCE

Information Security Student – Carleton University

Sept 2023 – Apr 2024

- Collaborated with cross-functional teams to design and execute a campus-wide phishing awareness simulation, strengthening cybersecurity readiness
- Documented and categorized server incidents by severity, producing structured reports to support engineering prioritization
- Conducted automated and manual testing prior to production deployment, reinforcing code reliability and operational stability
- Authored detailed process documentation to support onboarding, knowledge transfer, and long-term maintainability

PROJECTS

Reinforcement Learning for Adaptive Resource Management in Satellite Networks

Researched and implemented reinforcement learning techniques for adaptive resource allocation in high-throughput satellite communication systems. Studied core concepts including Markov Decision Processes, Dynamic Programming, and Temporal Difference Learning, and developed Python-based implementations of Q-Learning and Deep Q-Networks (DQN) using the Gymnasium framework. Trained and evaluated agents in benchmark environments to analyze learning behavior, policy convergence, and reward optimization, with the goal of extending these methods to dynamic bandwidth allocation, latency optimization, and traffic-aware scheduling in satellite networks.

Phase Locked Loop

The design and implementation of a high-performance 5.4 GHz Phase-Locked Loop (PLL) for a drone-mounted surveillance radar system. The primary objective is to create a stable frequency source capable of enabling precise obstacle detection and collision avoidance for delivery drones. The project centers on a Colpitts oscillator-based Voltage-Controlled Oscillator (VCO) as the core of the frequency synthesis system, integrated with frequency multiplier and divider chains, a mixer-based phase detector, and an active loop filter. Methods include circuit simulation and tuning using Keysight ADS MATLAB Simulink.

EDUCATION

2021 – 2026 Bachelor of Electrical Engineering, **Carleton University**

GPA: 3.8/4.0

TECHNICAL SKILLS

Programming	Java, Python, C, MATLAB, Assembly
Backend & Systems	REST APIs, Object-Oriented Design, SQL
AI / Machine Learning	Deep Q-Networks (DQN), CNNs, Reinforcement Learning, Gymnasium
Hardware / Embedded	PCB Design, Hardware Verification, Circuit Design, Signal Measurement