

# Colin Byrne

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## WORK EXPERIENCE

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### 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

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### Reinforcement Learning Taxi Agent (Deep Q-Network)

Designed and implemented a Deep Q-Network (DQN) agent in Python to solve the Gymnasium Taxi environment. Developed the reinforcement learning pipeline including epsilon-greedy exploration, experience replay, and target networks to stabilize learning. Structured the code modularly by separating the environment interface, neural network model, and training loop to improve maintainability and experimentation. Tuned hyperparameters and reward signals to accelerate convergence and improve policy performance.

### Digital Clock and Data Recovery System (VHDL)

Engineered a fully digital Clock and Data Recovery (CDR) system by designing and validating components including a phase generator, clock divider, bang-bang phase detector, digital filter, and PRBS test module. Performed functional simulations before full integration, emphasizing modular architecture and systematic debugging. Delivered a working multi-block design within a three-month timeline.

## EDUCATION

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

GPA: 3.8/4.0

## TECHNICAL SKILLS

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<b>Programming</b>	Java, Python, C, MATLAB, Assembly
<b>Backend &amp; Systems</b>	REST APIs, Object-Oriented Design, SQL
<b>AI / Machine Learning</b>	Deep Q-Networks (DQN), CNNs, Reinforcement Learning, Gymnasium