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Theodore Pinkerton

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Education

University of Toronto, BASc in Engineering Science (Machine Intelligence and Robotics) Sept 2020 – Apr 2025

- **Coursework:** Data Structures & Algorithms, Machine Learning & Artificial Intelligence, Probability & Statistics, Linear Algebra & Optimization, Distributed Systems, Embedded Systems, Robot Modelling & Control
- **Undergraduate Thesis:** Designed a reinforcement learning method using neural controlled differential equations for irregular, continuous-time POMDPs; built a GPU-accelerated JAX training pipeline and demonstrated empirical gains over baselines

Experience

Software Engineer Co-op, BioConnect – Toronto, ON May 2023 – Aug 2024

- Maintained and developed a Vue 3 (TypeScript) production UI used in safety-critical environments by first responders
- Implemented unit and end-to-end testing for a large existing production codebase
- Independently designed and shipped a support and diagnostics page for 3,000+ IoT devices
- Collaborated cross-functionally via GitFlow, Jira sprints, and daily stand-ups

Software Team Member, Robotics for Space Exploration – University of Toronto Sept 2024 – Apr 2025

- Built and tested rover control modules in ROS 1 (C++/Python) over CAN bus with custom hardware
- Managed simulation and validation in Gazebo and RViz; wrote scenarios to regression-test behaviors

Systems Administrator, Engineering Society – University of Toronto Apr 2024 – Apr 2025

- Maintained the web and hardware infrastructure of the oldest formal engineering organization in Canada
- Helped over 50 teams, clubs, and other student groups with 1000+ users with shared web infrastructure and resources
- Administered Google Workspace, DNS, firewall (pfSense), and local network infrastructure

Mechanical Team Lead, Robotics for Space Exploration – University of Toronto Sept 2021 – Aug 2023

- Led and mentored ∼15 engineering students to design the mechanical systems of a Rover for Mars-like terrain
- Personally designed and manufactured a carbon fibre suspension system
- Collaborated with leads and members of electrical, software, and science teams to create an integrated robotic system
- Helped the team regain competitive status post-pandemic by leading successful submissions to international rover challenges

Projects

Contributions and Engagement in Open Source Software

- Reported bugs, suggested direction, and contributed patches to tools I use
- Developed, packaged, and maintain several Rust crates with outside users and contributers

Home Server

- Set up and maintain a home server with clustered Proxmox nodes, NAS storage, remote access by VPN, and a reverse proxy

Quadrupedal Robot

- Designed and manufactured a quadrupedal robot using 3D printed parts, servos, and a Raspberry Pi
- Implemented inverse kinematics and gait control systems using Python
- Currently developing an embedded controller with no-std Rust on an ESP-32 microcontroller

Procedural Art

- Hobby creating procedural art pieces such as audio reactive shader pipelines from scratch using Vulkan, Rust, and GLSL and creative data visualization using Python and Pillow

Technical Skills

Programming Languages: Python, Rust, C, C++, Haskell, Slang, GLSL, Go, JavaScript, TypeScript

Technologies: Linux, ROS 1 & 2, Vulkan, JAX, PyTorch, Tensorflow, Git, REST, Fusion 360, SolidWorks, FreeCAD, KiCAD, Docker, Proxmox

Fields: Operating Systems, Software Interfaces, Artificial Intelligence, Machine Learning, Containerization & Virtualization, CI/CD, Networking, Embedded Systems, Computer Graphics, Robotics, Computer Vision