Daniel Thero

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Technical skills

Languages: Python, C++, C, Java, Lisp, SQL, Typescript, JavaScript, HTML/CSS
Tools/Frameworks: Keras, TensorFlow, PyTorch, React, Django, Flask, GTest
Other: Git, Linux, Firebase, Docker, ELK Stack, QNX, Jinja, Jenkins

Experience

Cyber Operations Specialist, Intern **Jan. 2023 – Apr. 2023**
Department of National Defense *Gatineau, QC, Canada*

- Employed an **ELK stack** on **Docker** with custom **Grok** patterns and a **JSON output plugin** to aggregate/parse activity logs from aircraft systems for analysis, visualization, and troubleshooting.
- Configured the **Logstash** pipeline to store data with **Elasticsearch** and view it with **Kibana**.

Software Engineer (RTOS), Intern **May 2022 – Aug. 2022**
Huawei Technologies *Kanata, ON, Canada*

- Researched and developed optimizations for **HarmonyOS 4.0 microkernel**, a Unix-like real-time OS, using a **Git workflow** and **Python scripting** on **Yocto Linux**, emulated using **QEMU**.
- Stress-tested scheduling and load-balancing in **mixed-criticality embedded systems** using **Raspberry Pi**
- Designed a **C++** performance test to measure isolated **RPC calls** with **nanosecond-accuracy**
- Implemented an **RB-tree** for **thread-queueing** to drastically reduce **futex** wait times
- Patched vulnerabilities in file creation by **caching** authorization info upon each **kernel call**

Embedded Software Developer, Intern **Sep. 2021 – Dec. 2021**
Ford Motor Company *Kanata, ON, Canada*

- Developed **C++ production code** for 2022 Ford vehicles, including **debug commands** on **QNX Momentics** with **unit tests** using **GoogleTest**, deployed onto hardware with **automotive ethernet**
- Implemented functionality to improve the reception of **NFC** (near-field communication) pings
- Practiced **Agile methodology** using a **Git workflow** and **Jira** for issue tracking in **Nexus**

Open-Source Developer, Intern **Jan. 2021 – Apr. 2021**
University of Waterloo *Waterloo, ON, Canada*

- Contributor for **Apache Drill SQL query engine** with **Bash**: refactored code, **configured SSL**
- Tested **Java** project changes using **Maven** build automation software with **POM XML** files
- Collaborated on **Django** websites for dataset reporting using **Postgres**, visualized with **Jinja**

Projects

Fine-Tuned LLM Code Translator using GPT-2

- A causal language model that converts code from Python to JavaScript, focusing on idiomatic structure. Uses the Hugging Face Transformers library, tracked with TensorBoard.

Deep-Learning Classifier for Insulator Defects

- A supervised Convolutional Neural Network using a pretrained Keras model and a TensorFlow backend to grade the hydrophobicity of preprocessed images of insulators with 99.6% accuracy.

Intelligent Chess Engine

- AI chess agent using an alpha-beta pruned minimax tree and heuristic board evaluation up to 6 layers deep. Incentivizes piece position, structure, capture potential, and mobility.

Traveling Salesman Neural Network

- Uses a Self-Organizing Map and a population of 90,000 neurons to find a near-optimal solution.

Education

University of Waterloo **Sep. 2019 – Aug. 2024**
Computer Engineering, Honours, Co-op, GPA 3.7 *Waterloo, ON, Canada*