Tarek Ibrahim

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Education

Carleton University Ottawa, Ontario

Bachelor of Engineering, Software Engineering (Co-op) — 3rd Year *Expected Graduation: April 2027*

Achievements: Dr. F.W.C. Mohr Entry Scholarship (Valued at $12,000)

Relevant Courses: Algorithms and Data Structures, Imperative Programming, Computer Architecture, Software Design, Operating Systems, Software Requirements Engineering, Advanced C++ Programming

Skills

Languages: C, C++, Python, Java, JavaScript/TypeScript, Lua

Technologies: Linux, GCP, SLURM, Docker, JAX, Node.js, VS Code, JetBrains Suite

Development: Git, Object-Oriented Programming, CI/CD, Bash, Jenkins, Jira, Agile

Experience

Bioinformatics Software Developer Jan 2025 – Apr 2025

Agriculture and Agri-Food Canada (AAFC) *Ottawa, ON / Hybrid*

- Optimize data pipelines for HPC using Nextflow and Snakemake with SLURM, enhancing software performance and reducing computational overhead.
- Implement and maintain software solutions in Python, Bash, PERL, and R, automating workflows and reducing manual intervention.
- Collaborate with a dynamic team to design, test, and deploy bioinformatics tools, contributing to the analysis and manipulation of high-volume biological datasets.

Junior Software Developer May 2024 – Aug 2024

James Evan & Associates (JEA) *British Columbia / Remote*

- Migrated entire testing framework, handling a large volume of tests and upgrading core dependencies, resulting in enhanced test coverage and reliability.
- Worked with and debugged existing ReactJS components, resulting in improved code maintainability.
- Utilized Jenkins for CI/CD, debugging issues in the pipeline to ensure smooth ticket completion.

Research Assistant May 2024 – Present

Carleton University *Ottawa, ON*

- Converted existing codebase to JAX for TPU optimization, enhancing model performance by parallelizing computations across distributed systems.
- Handled all aspects of cloud integration and deployment, ensuring efficient use of both GCP and HPC resources.

Projects

Atari AI: Reinforcement Learning Agent | *Python, JAX, Jupyter*

- Created a Deep Q-Network (DQN) to play Atari games, utilizing OpenAI Gym API.
- Leveraged Weights & Biases (WandB) for tracking experiments and monitering the model's performance.

TDocker: Docker Compose Suite for Web Apps | *Docker, NGINX, Networking*

- Designed Docker Compose configurations to deploy web apps, integrating within a NGINX network.
- Integrated services like QBitTorrent, Ollama, Jupyter Server, and KeeWeb, streamlining environments.

OS Scheduler: Syscall and Memory | *C, Unix*

- Developed simulators as a proof of concepts for process forking, memory management, and concurrency using semaphores, based on principles from *Operating System Concepts* by Abraham Silberschatz *et al.*
- Implemented CPU scheduling algorithms combined with dynamic memory partitioning for trace-driven CPU scheduling, enhancing resource management and efficiency.

TSuite: Automation and Workflow Tools | *Bash, Linux*

- Created a suite of Bash scripts for automating tasks such as SSH key management and Docker orchestration.
- Improved workflow efficiency by streamlining repetitive tasks and providing reusable functions.