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/TS, Lua
Technologies:	Linux, GCP, SLURM, JAX, PyTorch, Docker, Node.js, ReactJS, Jest
Development Tools:	Git, Bash, Jenkins, GitLab CI, VS Code, JetBrains Suite, Jira

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.

Junior Software Developer — May 2024 – Aug 2024

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

- Led migration from enzyme-react-adapter to React Testing Library, handling a large volume of tests with Jest and upgrading core dependencies along with ReactJS.
- Upgraded JasperReports from 6.x to 7.x, managing breaking changes and significant updates, including modifications to internal APIs and deprecated features.
- Utilized Jenkins for CI/CD, upgrading runtime environments and optimizing build scripts to enhance pipeline efficiency and deployment processes.
- Worked in a Scrum team, learning agile methodologies and contributing to the full software development lifecycle.

Research Assistant — May 2024 – Present

Carleton University — *Ottawa, ON*

- Utilized PyTorch to develop and train Generative Adversarial Networks for computer vision tasks.
- Developed cost-effective solutions for limited GCP TPU and HPC resources to optimize resources efficiency.

Projects

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

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

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

- Designed Docker Compose configurations to streamline environments, integrating within a NGINX network.
- Integrated services such as Ollama, Samba, and WireGuard, among others, as a self-hosted on-premise solution.

OS: Syscall, Process, & Scheduler Simulators | *C, Unix*

- Developed collection of simulators as a proof of concepts for process forking, memory management, concurrency, and filesystem operations, 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*

- Developed scripts for SSH key management, Docker access, NAS container syncing, and on-login metrics.
- Organized the suite with directories for configurations, aliases, and exports, including a notes/help folder for complex commands, rysnc pipelines, and troubleshooting.