DENYS INHUL

Portfolio
linkedin.com/in/Denys-Inhul
github.com/MoonArchitect
denys.inhul@gmail.com

Education

University of Waterloo — **Waterloo, ON, Canada**
Bachelor of Computer Science — 98% Faculty Average (4.0 GPA) — *Expected graduation April 2026*

Skills

Programming Languages Python | TypeScript | JavaScript | HTML & CSS | C++ | C | C#
Technologies React | Three.js | Node.js | Express.js | MongoDB | TensorFlow | NumPy | Beautiful Soup
CUDA | Nsight Compute | Git

Notable Projects

Facebook UI clone

TypeScript | React

- Recreated Facebook's desktop UI in **TS** and **React**, implemented pages include Home, Friends, Profile pages.
- Implemented seamless transitions between several content-heavy pages and developed a route-aware UI by using **React Router v6**.
- Developed a highly-composable set of components/modules to support dynamic and diverse content types.
- Working on an efficient **REST API** and **Node.js** backend to allow for interactive and quickly deliverable content.

Recipe Search App

TypeScript | Python | Node.js | Express.js | MongoDB

- Implemented multithreaded scraper in **Python** to scrape and then populate **MongoDB** with **10,000+** recipes.
- Developed a **Node.js** backend to interact with **MongoDB** and provide users with enhanced functionality of **fuzzy searching**, **autocomplete** and **search options**.
- Designed a **REST API** with flexible query parameterization and tested it with **Insomnia**.
- Implemented a parser in **Python** to approximate recipe cost based on the type and amount of ingredients used.
- Worked closely with a team of 2 front-end developers to design and provide desired features.

Convolutional Neural Networks

Python | TensorFlow

- Developed a mini-framework in **Python** for automated and consistent testing and training of image classification models (tailored towards low-resolution images).
- Used my framework to perform **100+ experiments** with the goal of consistently comparing performance of different model architectures and data augmentation methods in the task of image classification.
- Implemented **20+ ML papers** ranging from model architectures, learning rate schedules to data augmentation.
- Implemented Deep Convolutional GAN using TensorFlow reaching an **FID score of 22.2** on 128px FFHQ dataset.

N-Body Simulations on GPUs

C++ | CUDA | Nsight Compute | JavaScript | Three.js

- Developed a framework in **C++** and **CUDA** to perform high-performance 3D N-body simulations on **GPU**.
- Implemented and optimized several simulation algorithms in **CUDA** to run on **10,000+ GPU cores** with high GPU utilization while minimizing memory dependency stalls.
- Achieved **4x** fragmentary and **2x** overall performance increase by using **NVIDIA Nsight Compute** to perform in-depth profiling and optimization.
- Implemented a tool for creating interactive visualizations of cosmological simulations using **JS** and **Three.js**.

Chess AI (National Candidate Master level)

C#

- Developed a chess AI in **C#** to perform at **~2100 Elo rating**, roughly equivalent to National Candidate Master.
- Implemented multithreaded versions of **8** distinct algorithms to perform best-move search (ranging from basic Alpha-beta pruning to combination of Principal Variation Search + zwSearch).
- Implemented **7** additional search-space pruning techniques like cache using Zobrist hashing, null moves, etc.
- Achieved a **7 million** times per second execution rate on 1 CPU thread for a board evaluation function that considers **8+** factors by using bit-mask matrices and bit-operations.

Quadcopter (Drone)

C | C# | STM32 HAL

- Assembled a drone with an **STM32** microcontroller, capable of **1200W+** max power and **3.5kg+** thrust.
- Implemented several fail-safe mechanisms in **C** to allow for safer testing and development of the drone.
- Developed a control-center in **C#** that established **real-time 2-way communication** between the drone and PC.
- Implemented major stages of signal processing in **C** — digital signal filtering, quaternion sensor fusion and PID controller for the motors — by integrating open-source software and tools with my own codebase.