Hamza Elmi

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Education

University of Guelph Guelph, ON

Honors Bachelor of Computing, Computer Science (Co-op) *Sept. 2022 – May 2026*

- ***GPA:** 3.7/4.0, Dean's List*
- ***Related Coursework:** Algorithms, Operating Systems, Data Structures, Object Oriented Programming, Application of Microcomputers, Intermediate Programming, Discrete Structures I/I, Statistics I*

Experience

Undergraduate Research Assistant May 2024 – August 2024

University of Guelph *Toronto, ON*

- Built Python-based computer vision pipeline using Detectron2 for horse eye feature detection, automating frame extraction & analysis for **700+** annotated images
- Optimized workflows through custom scripts, reducing manual **processing time by 30%**
- Presented findings in weekly research meetings to cross-functional teams

Muse Capital Corp - Software Development Intern May 2023 – August 2023

Software Development Intern *Toronto, ON*

- Drove the creation of new software functionalities that directly addressed customer feedback, leading to over **1,500** user interactions with the new features within the first month, validating the product's market fit.
- Optimized 10+ codebases, resolving recurring bugs to improve system stability and increase **daily active users by 20%** in two months.
- Enhanced problem-solving skills by helping a team of 20 employees use a management system to collaborate on projects.

Projects

StoolHealthAnalyzer | *Python, OpenCV, React, Docker, FastAPI* Dec.2024 – Present

- Developed AI-powered full stack medical analysis system using Python (backend) computer vision (OpenCV) & TypeScript React frontend
- Engineered medical imaging pipeline analyzing **15+ clinical metrics** (color, consistency, shape) using HSV color space analysis and texture recognition algorithms
- Achieved 90% clinical alignment by integrating Bristol Stool Scale with Groq-accelerated AI models, reducing diagnostic errors by 25% in pilot testing
- Designed encrypted storage system for medical data compliance using Python cryptographic libraries

FocusTree | *TypeScript, React, Node.js* Jan.2024 – Feb .2024

- Engineered a full stack, interactive, gamified productivity platform that transformed standard focus sessions into a dynamic tree-growth experience—boosting user engagement by **30%** and reducing session drop-off by 20%.
- Designed and implemented a real-time streak tracking system with dynamic UI updates that increased consistent user participation by 25%, directly supporting habit formation.
- Integrated an AI-powered motivation engine using OpenAI's API to deliver personalized encouragement, which improved daily active usage by **20%** and reinforced long-term retention.

DataCompressX| *Python, Huffman's Algorithm, Docker* May 2024 – Sept.2024

- Developed a lossless compression and decompression algorithm inspired by WinZip, utilizing Huffman's Algorithm to reduce file sizes by up to **40%** compared to original data.
- Optimized the algorithm for efficiency, achieving a **25%** reduction in processing time over baseline implementations through streamlined code and effective resource management.
- Validated the solution across 10+ diverse datasets, ensuring consistent accuracy and reliability in compression performance

ZooScope Animal Identifier| *C* Dec 2023 – Jan.2024

- Developed a k-nearest neighbors **(k-NN)** algorithm to classify animals achieving **86%** accuracy on a test set
- Conducted distance-based calculations using Euclidean Distance, Hamming Distance, and Jaccard Similarity, enhancing classification
- Structured a dataset of **100 animals**, each with 10 attributes and a class label, to prepare units valuating a k-nearest neighbor's model

Technical Skills

Programming Languages: Python, Java, C, TypeScript, JavaScript, SQL, HTML5, CSS, R, Assembly, C++, PostgreSQL

Frameworks/Libraries: ReactJS, Node.js, FastAPI, Flask, TensorFlow, OpenCV, Pytorch, Business Intelligence, technical support

Developer Tools: Git, SDLC, CAD, Linux, VS Code, PyCharm, Azure, Dynatrace, Agile, Splunk, cloud technologies, Oracle, VMware