Liam Nicholson

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Education

George Mason University, MS in Computer Science — Aug 2024 – Aug 2025

George Mason University, BS in Computer Science — Aug 2020 – May 2024

- Founder and President of GMU Chess Club, Outstanding Undergraduate Teaching Assistant Award Recipient

Experience

Software Engineer Intern, KBR Inc. – Chantilly, VA — May 2025– Present

- Designed and implemented a knowledge graph pipeline that connects an on-premise relational database to a NodeRAG-based LLM, enabling domain-specific question answering about internal property data.
- Applied period accumulation techniques for signal reconstruction to accurately recover periodic signals when sampling below the Nyquist limit.
- Processed Synthetic Aperture Radar (SAR) imagery to detect oil slicks using a multi-stage pipeline combining mean and morphological filtering with an MVP neural network for kernel selection and classification.

AI Engineer, Frontier Foundry – Remote — Aug 2024 – April 2025

- Scraped and processed multilingual text data from diverse sources using NLP to build a novel satellite dataset of **2.5K** Low-Earth Orbit (LEO) satellites, enabling risk classification via ML models.
- Developed an offline language model and GUI tool for querying structured/unstructured data, reducing memory usage by **20%** and improving user accessibility.

Software Engineer Intern, Frontier Foundry – Remote — Jan 2024 – Jul 2024

- Reduced data processing time by **40%** by automating daily market data ingestion via Apache Airflow, using timed DAGs to transfer data over SFTP, back it up to Azure Blob, and feed it into predictive models.
- Improved portfolio performance by **10%** through risk-adjusted return analysis with the Sharpe ratio, leveraging optimization techniques such as stochastic gradient descent and grid search.

Software Engineer Intern, Bloxlink – Remote — Jan 2023 – May 2023

- Refactored a high-traffic Discord bot to implement a seamless verification system between Roblox and Discord, improving user experience across **1M+** servers and **88M+** users.
- Utilized Python, MongoDB, and the Roblox API to securely retrieve and manage user data, ensuring privacy and efficient access.

Projects

Rubik's Cube Detector and Solver — Full Presentation

- Developed a vision-based system that detects and reconstructs a Rubik's Cube's full state from real-world video input, achieving over **96%** color classification accuracy under varying lighting and reflection conditions.
- Applied ORB-based frame stitching, DBSCAN clustering, and HSV segmentation to identify cube facelets in unconstrained scenes, feeding the results to the Kociemba solver for solution generation.
- Built an interactive PyGame GUI to visualize the detected cube in 3D and display the computed solution sequence in real time.

Technologies

Languages: Python, Java, C/C++, SQL, Cypher, HTML, R, Assembly, Matlab

Libraries: Keras, TensorFlow, PyTorch, Scikit-learn, Pandas, NumPy, HuggingFace Transformers, OpenCV, NLTK, SpaCy, Gensim, Matplotlib, Seaborn, LangChain

Tools: Git/GitHub, Agile, SMSS, JIRA, Azure Blob Storage, Apache Airflow, Neo4j, LaTeX, REST APIs, JSON, STK