CALLUM FORSYTH

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Software Engineer (Systems and Cybersecurity)
Final year Computer Science student specializing in high performance C# development and secure systems. Experienced in leveraging Data Oriented design (Unity Job System) and Linux based infrastructure to build robust, scalable applications.

Systems and Game Engine	Security and Infrastructure	Tools and DevOps
C# (.NET), Rust, Flutter	Network Security, VPN	Git , Linux (Fedora)
Multithreading (Job systems)	Identity Management (OMV)	Blender (3D Modelling)
A* Pathfinding, State Machines	Data Acquisition and Artefact Analysis	Firebase (NoSQL), SQL

Project: **Systems Driven 2D Platformer**

Tech: **Unity • C# • A* (Binary Heap) • State Patterns**

- Developed a 5-level technical showcase focusing on modular Finite State Machine (FSM) AI logic.
- Optimized pathfinding performance by implementing a custom A* algorithm using a Binary Heap, reducing the computational complexity of node evaluation.
- Result: A scalable AI system capable of handling complex platforming navigation with minimal CPU overhead.

Project: **Adversarial AI: MiniMax and Recursive Search**

Tech: **Unity • C# • Algorithm Design • Recursion**

- Engineered an "unbeatable" Tic-Tac-Toe opponent using the Minimax algorithm with recursive game-tree traversal.
- Implemented Heuristic Evaluation to score potential board states, ensuring the AI prioritizes optimal win-paths and defensive blocks.
- Result: Demonstrated a deep understanding of decision-tree logic and recursive optimization in a real-time environment.

Project: **Secure Private Cloud Infrastructure**

Tech: **Linux • WireGuard VPN • OpenMediaVault • Networking**

- Deployed a Linux-based NAS utilizing OpenMediaVault for centralized data management and storage.
- Configured a WireGuard VPN tunnel to facilitate encrypted, peer-to-peer remote access, ensuring secure file retrieval outside the local network.
- Established a robust Identity and Access Management (IAM) schema to enforce the Principle of Least Privilege across user directories.

Experience

2021 – present

Team Leader (Acting) | Co op Food

- Leadership: Optimized shift workflows and inventory management for a team of 5, ensuring 100% compliance with strict closing and security protocols.
- Problem Solving: Was the primary point of escalation for customer and till issues, resolving 3 incidents on average per day.

Education

Bsc (Hons) Computing Science and Cyber Security | Heriot-Watt University, Edinburgh sept 2022 – june 2026 (Expected)

- Key Specialized Modules:
  - **Network Security**: Focused on protocol analysis, threat modelling and securing distributed architecture.
  - **Intelligent Robotics:** Implementation of pathfinding and real time decision making logic.
  - **Software Engineering:** Advanced application of design patterns and agile methodologies.
  - **Digital Forensics:** Study of the forensic process including data acquisition, file system analysis and artefact recovery. Gained experience in maintaining Chain of Custody and utilizing industry standard tools to reconstruct security incidents.
- Technical Achievements:
  - Demonstrated proficiency in Data Structures and Algorithms through custom implementations of O(nlogn) search and sorting systems.
  - Built and managed an air-gapped forensic lab on Linux for the analysis of compromised system artefact, utilizing Volatility for memory dumps and Autopsy for file system reconstruction.