

# HARRY FOSTER

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## PROFILE

Computer Science student at the University of Manchester (First Class, 79%) with a strong foundation in full-stack development, game programming, and mobile apps. Proficient in Python, C#, JavaScript, and modern frameworks like React, Node.js, and Flutter. Passionate about building real-world, user-focused software.

## EDUCATION

### The University of Manchester

Bachelor of Science in Computer Science (Expected June 2027)

Manchester, England

Sep. 2024 – Present

- Achieved **First Class (79%)** in First-Year Examinations.

### Bury Grammar School

A Levels: Computer Science (A\*), Maths (A), Further Maths (A), Physics (A); EPQ: (A\*)

Bury, England

Sep. 2022 – Aug. 2024

### JESS Dubai / King's College Murcia

11 GCSEs including Maths (9), Computer Science (9), Further Maths (8)

Dubai, UAE / Murcia, Spain

Sep. 2019 – June 2022

## PROJECT EXPERIENCE

### FosterML - Minimal ML Library in C++

June 2025 – Present

- Designed a C++ tensor library with an automatic differentiation (autograd) engine to support classical ML algorithms, with modular architecture for future GPU acceleration.
- Implemented CPU-based tensor operations, broadcasting, and linear algebra primitives, enabling backpropagation for neural networks.
- Planned extensible data loaders for CSV, image, and tabular datasets, facilitating experimentation with supervised and unsupervised learning algorithms.

### WHILE Compiler - Educational Compiler in C

June 2025 – Aug. 2025

- Implemented a compiler for the minimal WHILE language targeting x86 NASM, covering lexical analysis, top-down parsing, semantic checks, and assembly code generation.
- Extended language with integer support, C-style block syntax, and print/input instructions, making it suitable for practical program evaluation.
- Developed a Gödel-inspired decoder mapping natural numbers to valid WHILE programs, demonstrating understanding of formal computation and encoding techniques.

### Portfolio & Blog - Full-Stack Web App

Jan. 2025 – Present

- Developed a Next.js + TypeScript portfolio with dynamic Markdown blog, email subscription system, downloadable CV, and SEO optimization for visibility.
- Designed responsive, accessible UI with project showcase, tutorials, and modular architecture to support ongoing content expansion.
- Integrated MongoDB via Mongoose for data storage, including subscription management, comment system, and dynamic routing for blog posts.

### Chess Engine - AI & WPF GUI

Sep. 2023 – Apr. 2024

- Developed a high-performance C# chess engine with Minimax search, Alpha-Beta pruning, bitboard representation, Zobrist hashing, and an opening book for optimized play.
- Built a WPF frontend with real-time move validation, analysis board, and multiple modes (two-player, vs AI, timed matches), showcasing algorithmic reasoning and interactive UI design.
- Implemented evaluation functions for material balance, positional advantage, and mobility, demonstrating applied AI techniques in game decision-making.

## TECHNICAL SKILLS

**Languages:** Python, C, C++, C#, Java, JavaScript, TypeScript, Dart, SQL, PHP, HTML, CSS

**Frameworks & Libraries:** React, Next.js, Flutter, Bootstrap, Tailwind CSS, Express.js

**Tools & Platforms:** Git, Docker, Firebase, Supabase, Android Studio, Linux, MySQL, MongoDB