Joe Loach (he/him)

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Profile

Motivated and results-driven Software Developer with a strong expertise in SoC design, AI, and GPU programming. Demonstrated experience in developing innovative hardware and software solutions through University projects and freelance work. Looking to utilise technical skills in a developer role to contribute to cutting-edge software and hardware development.

Education

Bachelor of Computer Science   Sep. 2021 - Jun. 2024
The University of Manchester

- Achieved a High 2:1, with a First-Class grade for third-year dissertation.
- Top 5% of class for innovative AI model implementation and creative project approaches.

A Levels   Sep. 2019 - Jun. 2021
The Ecclesbourne School

A* Computer Science, A* Mathematics, A Physics

Professional Experience

Freelance Software Developer | C#, Unity, Adobe Photoshop, Github, Teams   Jun. 2023 - Sep. 2023
Digital Spirit Ltd

- Designed complex mesh effects for non-destructive 2D UI editing in Unity.
- Created custom Unity editor UIs with multi-object and undo support, enhancing development efficiency.
- Collaborated closely with clients over GitHub and Teams, ensuring timely delivery and superior user experience.

Key Projects

ARM Assembler | Rust, Javascript, Markdown, mdbook   Aug. 2024 - Present

- Developed a hand-written lexer and parser for recoverable syntax trees and more informative errors.
- Created an interactive learning handbook using mdbook with runnable code for ARM instructions.

Third Year Project & Dissertation | Rust, WGSL, Vulkan, WebGPU   Sep. 2023 - Apr. 2024

- Implemented GPU kernels to accelerate a path tracing algorithm for real-time black hole rendering.
- Developed a hardware agnostic renderer with multithreading and SIMD on the CPU.

Coursework Highlights

Implementing System-on-Chip Designs | Verilog, Cadence   Jan. 2024 - May. 2024

- Developed, debugged, and verified a CPUs FSM module inside a real-world environment.
- Integrated an ASIC Mandelbrot hardware accelerator with a VGA controller.

Natural Language Understanding | Keras, Python   Jan. 2024 - May. 2024

- Designed deep learning models for textual evidence detection, leading a small team to deliver high-accuracy results.
- Utilised novel DNN architectures adapted from state-of-the-art research.

Teaching Experience

GCSE Maths and Physics Tutor   Jun. 2021 - Sep. 2021

- Delivered structured tutoring to secondary school students, focusing on creative explanations to fill knowledge gaps.

Technical Skills

Programming Languages

Rust, Verilog, C#, C++, C, Python, JavaScript, TypeScript, Lua, Haskell, Java, HTML, CSS

Technologies

git, cargo, VSCode, Visual Studio, Cadence, Eclipse, Adobe Photoshop

Interests

- **Squash**: Enthusiastic squash player with 10 years of experience, actively participating in university society competitions.
- **Music**: Self-taught guitarist, experimenting with music creation and recording using Reaper software.

References available upon request