

Joe Loach (he/him)

✉ joe.gloach@gmail.com | 🌐 joeloach.co.uk | 🌐 /in/joe-loach | 🎧 joe-loach | 📞 07754325486

Profile

Highly motivated and results-oriented Software Developer specialising in high performance systems and Rust development. Proven ability to deliver innovative hardware and software solutions through University projects and freelance experience. Seeking a challenging developer role to contribute to cutting-edge technology and research.

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.
- Designed front and back of 'Money Tracker' website in NodeJS and Vue, winning creativity award.

A Levels

Sep. 2019 - Jun. 2021

The Ecclesbourne School

A* Computer Science, A* Mathematics, A Physics

Professional Experience

Software Developer | C#, Unity, Adobe Photoshop, GitHub

Jun. 2023 - Sep. 2023

Digital Spirit Ltd

Developed a suite of custom graphical tools within Unity, including:

- A non-destructive 2D UI editing system featuring complex mesh effects, which streamlined UI development and reduced artist-tooling friction.
- Custom Unity editors with multi-object and undo support, enhancing development efficiency.

Key Projects

Web Card Game | Rust, axum, tokio, JavaScript, NativeDB

Dec. 2024 - Present

Engineered a highly scalable web server and client, utilising:

- Multi-threaded, async code, gracefully degrading under extreme load.
- Robust and error tolerant game protocol implementation.
- Custom authentication middleware and JWT to secure routes.
- Maximum data integrity using crash tolerant transactional database.
- Tightly integrated logging using tracing for maximum debuggability.

Third Year Project & Dissertation | Rust, WGSL, Vulkan, WebGPU

Sep. 2023 - Apr. 2024

Delivered a high-performance, hardware-agnostic path tracer for real-time black hole rendering, leveraging:

- GPU kernel implementation using Vulkan Compute shaders for significant performance gains over CPU rendering.
- Multithreading and SIMD optimisations using Rayon to maximise utilisation of available resources.

- Achieved 30x speedup using GPU compared to multi-threaded CPU performance.

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

Technologies

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

Interests

- **Sports:** 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