

Joseph Pickering

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PROFESSIONAL SUMMARY

Low-level C++ Software Engineer specialising in **simulation** and engineering of **graphics pipelines** and 3D rendering. Experience managing complex **GPU resource lifetimes and synchronisation** within Vulkan-based pipelines, leveraging **Modern C++** for high-performance stability. Experience implementing **graphics pipeline validation tooling**, integrating **Address and Thread Sanitisers**, and architecting **CI/CD infrastructure**.

TECHNICAL SKILLS

- **Languages:** Modern C++ (C++17/20+), GLSL, Python, YAML (CI/CD)
 - **Graphics:** Vulkan, OpenGL 4.x, Shader Programming, DirectX
 - **Tools & Environment:** Visual Studio, CMake, RenderDoc API, Clang Sanitisers, Linux/Windows, GoogleTest, DevOps, GIT,
 - **Specialisations:** Automated Graphics Validation, frame lifecycle awareness, CPU to GPU data flow.
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PROFESSIONAL EXPERIENCE

BMT | Simulation Software Engineer *April 2026 – Present*

- **Improved systems** by fixing determinism related bugs in client-server simulation software.
- Aided to the integration and development of in-house tooling for other areas of the team which utilise rendering and modelling principles.
- Directed required modernisation improvements to legacy codebases and frameworks, pushing for further stability.

Datapath | Software Engineer *June 2022 – April 2026*

- **Graphics Validation Infrastructure:** Created and tested vulkan swapchains and frame presentation using QR-enabled frame inspection to embed diagnostic metadata.

- **System Stability & Memory Safety:** Integrated **Clang Sanitisers** (Address/Thread) into build pipelines; investigated multithreading and memory-management issues in performance-sensitive C++ code.
 - **CI/CD & Automation:** Developed and maintained CI pipelines (YAML) to automate generation of frame validation data.
 - **Media & Data Flow:** Implemented **FFmpeg** contexts to move frame data across CPU/GPU boundaries for converting GPU buffers into diagnostic video output.
 - **Cross-Team Collaboration:** Delivered backlog items across multiple areas of the codebase, contributing to design discussions and workflow improvements within a large-scale graphics-adjacent environment.
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KEY PROJECTS & RESEARCH

Basic Vulkan Renderer

- Implemented a project following the updated khronos Vulkan-Tutorial. Including multiple frames in flight, multisampling, mipmapping, and basic geometry loading. Future plans to develop into a **shadow mapping** Vulkan project.

Independent 3D Renderer (Python Passion Project)

- Designed a custom renderer featuring a **Render Graph** architecture and Scene Abstraction in python to clone that of the game Old School Runescape
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EDUCATION

Staffordshire University | BSc Games Programming | 2:1

- **Graphics & Rendering:** Advanced real-time rendering in **DirectX 11**, utilisation of **Compute Shaders** and the programmable pipeline.
 - **Mathematics:** Comprehensive coverage of **3D Linear Algebra**, vector math, and coordinate transformations.
 - **Physics Simulation:** Implementation of **Rigid Body Dynamics** and force-based systems.
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ADDITIONAL INFORMATION

- **Nationality:** British Citizen (Sole Nationality) with SC clearance.