Rhys Duff

Software Developer · Edinburgh, Scotland

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Profile

Software developer with three years at 4J Studios, specialising in C++ and real-time graphics with DirectX 12, DirectX 11 and HLSL. I work across rendering, engine and tools: integrating Noesis GUI with an in-house renderer, writing post-processing effects and extending the studio's texture editor. Before 4J, I helped build a DirectX 12 and PlayStation 5 teaching framework at Abertay University, where I graduated with a First-Class BSc in Computer Games Technology.

Experience

4J Studios, Dundee

Software Developer · October 2025 – Present

Graduate Software Developer · October 2023 – October 2025

- Integrated the Noesis GUI rendering backend with the studio's in-house rendering engine, keeping UI rendering consistent with the rest of the pipeline.
- Built in-game UI scenes in Noesis with XAML and view-models, supporting designer-driven workflows.
- Implemented post-processing effects, including bloom, vignette and depth of field.
- Extended and maintained the in-house texture editor, a core part of the content pipeline, plus smaller editors and utilities for artists and designers.
- Debugged C++ and HLSL across engine and rendering code using Visual Studio and PIX.

Abertay University, Dundee

Research Fellow · July 2023 – September 2023

- Co-developed a DirectX 12 framework for teaching future Abertay undergraduates.
- Built an abstracted amplification and mesh shader (meshlet) pipeline.
- Integrated the EnTT entity component system into the DirectX 12 and PlayStation 5 frameworks, and developed an abstracted rendering API.
- Improved the efficiency and robustness of the DirectX 12 heap allocator.

Earlier roles

- **Customer Assistant**, Tesco, Dundee · June 2022 – October 2022
- **Online Shopper**, Sainsbury's, Dundee · October 2018 – June 2021

Selected projects

- **Isosurface algorithms on the GPU** (Honours project, A+): implemented Marching Cubes, Surface Nets and Dual Contouring in DirectX 12 compute shaders, with a real-time terrain editor for comparing their performance and visual quality.
- **Foundation Engine** (ongoing personal project): a C++ game engine exploring system architecture. Its renderer has moved from OpenGL 4.6 to DirectX 12, with an EnTT entity component system and a service registry for engine subsystems.
- **Graphics programming in DirectX 11** (A): dynamic tessellation with hull and domain shaders, PCF soft shadows for directional and spot lights, Gaussian bloom and normal mapping.
- **Animation systems** (A+): a 3D skeletal animation system with a blend tree (linear, 2D, additive and ragdoll nodes), plus a 2D skeletal animator and sprite animation, built on an entity component system.
- Up For Delivery (DARE Academy 2022 finalist, SnakeBride Software): general programmer and producer on an Unreal Engine 4 puzzle game. Built procedural clouds, volumetric lighting and fog, foliage and a water shader, and led daily stand-ups.

Skills

- **Languages:** C++, HLSL
- **Graphics:** DirectX 12, DirectX 11, OpenGL 4.6, compute, mesh and amplification shaders, tessellation, post-processing
- **Platforms:** PC, PlayStation 5
- **Tools:** Visual Studio, PIX, Git, Unreal Engine 4, Unity, Noesis GUI
- **Foundations:** data structures and algorithms, applied mathematics, debugging and profiling

Education

BSc (Hons) Computer Games Technology, Abertay University, Dundee

First-Class Honours · September 2019 – May 2023

- **A+:** Honours Project, Programming Animation Systems, Network Systems for Game Development, Game Programming
- **A:** Graphics Programming with Shaders, Data Structures and Algorithms 1 and 2, Procedural Methods, Mathematics and Artificial Intelligence

Additional information

- **Treasurer, Abertay Game Development Society** · September 2019 – May 2020: managed the society's budget, oversaw health and safety at game jams, volunteered at Global Game Jam 2020 and helped secure guest speakers.
- **Languages:** English (native), French (A2)
- **Interests:** 3D modelling in Blender, films, video games
- **References** available on request.