JACOB WORGAN

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Dear Hiring Manager,

I am excited to contribute to **Games Programming (Render | Pipeline | Tools | Engine) Roles**. With a strong background of over 10 years' experience across the game production pipeline and a passion for C++ games systems development, cross-disciplinary working, and real-time simulation, I have built strong technical knowledge. I am eager to contribute my systems engineering proficiency to support the delivery of robust, performant, scalable code to power immersive gaming experiences.

Holding both a BA and an MSc in computer graphics from the **National Centre of Computer Animation** at **Bournemouth University**, I learned core 3D mathematics, software engineering principles, and design patterns used in graphics rendering. Developing C++ tools such as **Villager Navmesh Navigation** used OpenGL in Qt contexts with UI, mouse controls and custom shaders, written under TDD principles using Google Test and CMake. **FrankenSponge** allowed me to engage in deep simulation research, evaluating implementation techniques to allow for real time fluid simulation in Unreal Engine using Niagara and HLSL, with custom extensions for player intractability. Similarly, **Hair Simulation** required prototyping solutions and refining implementations into scalable, maintainable codebases. This experience has developed the core engineering skills fundamental to any programming role.

In my current role as a **Games/Tools Developer**, I engineer advanced development tools that improve workflow efficiency, system scalability, and in-depth gameplay systems, across multiple prototype projects. This includes **Harvy 2**, a procedural plant growth simulation system enabling complex environment-aware gameplay using a data-driven architecture. I regularly engage in Game Jams to refine my games design and pipeline techniques, most recently as part of a group for the **Global Game Jam 2026**. A major game project I am currently prototyping is aiming to take these abilities and apply them to a platforming game, practicing full engine-to-game production lifecycle competence. These projects require integrating C++ systems across rendering, simulation and gameplay frameworks, while keeping me up to date with best practice in industry.

Moreover, I have a proven ability to collaborate effectively within multidisciplinary teams. As **Pipeline Lead** on the **Slug Game** project, I established version-controlled workflows and development pipelines that allowed the team to deliver a complete playable project within deadline, increasing team productivity and iteration speeds. Working on **Magico**, I worked in a team with animators, tailoring how I communicated to allow for efficient cross-disciplinary working. As a **Freelance VR Programmer** for a doctoral research project, I engineered a VR physiotherapy application designed to track rehabilitation movements, converting physical motion into gameplay metrics. This required defining requirements for engineering challenges, balancing technical problem-solving with communication to a non-technical client, while delivering against real requirements. Working across departments, these roles necessitated understanding complex multidisciplinary challenges and communication.

I am particularly drawn to companies committed to inclusivity and diversity, as well as those that mirror my own relentless drive towards crafting at the cutting edge of realistic and detailed game worlds and systems.

Upon reviewing my application, I welcome an opportunity to interview and discuss how my skills align with your needs, and how I can bring my technical expertise, systems-engineering mindset and collaborative approach to your company.

Yours faithfully,
Jacob Worgan

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PERSONAL SUMMARY

Adaptive, research-driven **Games Programmer (Render | Pipeline | Tools | Engine)** with 10+ years of experience across full game production pipeline, specialising in C++ systems development, engine architecture and real-time simulation. Proficient in large mixed codebases, tools/pipeline development and cross-disciplinary working. Eager to relocate and contribute to large-scale engine systems while delivering robust, scalable technical foundations for immersive gaming experiences.

PROFESSIONAL & TECHNICAL SKILLS

- **Engine & Systems Programming:** Systems Design | Performance Optimisation | Memory Management | Large Codebases | Cross-Platform Development | Data-Driven Systems
- **Gaming Software Development:** Unreal Engine | Unity Engine | Automation Testing | VR Systems | Animation in Engine | Materials | Engine Pipeline | Blueprints
- **Coding Language:** C (SDL) | C++ (Qt, Google Tests, Python & Lua Script Integration) | C# | Visual Basic | Lua | Python (Tkinter UI, PyDoc, Pillow, Maya APIs (OpenMaya))
- **AI & Simulation Implementation:** L-Systems | Boid Flocking Systems | Hair Simulations | A* Pathfinding | NavMesh Systems | Fluid Simulations | Behaviour Trees | AI Behaviour Systems
- **Graphics & Systems:** OpenGL | NGL | GLSL | HLSL | Shaders | Rendering Pipelines | Niagara Effects (Unreal Engine) | Renderman RIB | Renderman OSL | Houdini
- **Build & Deployment:** GitHub | Git | CMake | Makefiles | Bash Scripts | Visual Studio
- **Software Engineering:** Agile | Scrum | Test-Driven Development (TDD) | Pair Programming | Modular Design | Code Refactoring | Documentation | Bug Reports | OOP | SOLID
- **Mathematics & Physics:** 3D Mathematics | Linear Algebra | Physics Simulation
- **IT Proficiency:** Microsoft Office (Word, Excel, PowerPoint, Outlook, Teams) | Zoom
- **Animation Language & Software:** Nuke | Substance 3D Painter | Substance 3D Designer | Autodesk Maya | Maya Mel Scripting | Animating | Modelling | UVing | Texturing |
- **Artistic Features & Software:** Character Design | Illustration | Life Drawing | Photoshop | Krita
- **Research:** Parsing Academic Papers | Implementing Research Papers | Evaluating Implementation Techniques | Critical Evaluation | Photography
- **People:** Excellent Verbal & Written Communication | Empathy | Initiative | Positive Attitude | Flexibility | Relationship Building | Peer Support | Team Formation | Leadership | Working To External Briefs | Pitching| Problem Solving | Organised
- **Languages:** English (native) | Japanese & French (intermediate)

WORK EXPERIENCE

ENGINE RESEARCHER & DEVELOPER (Various Projects) | Bournemouth U. 02/2018–12/2023

- Developed custom engine systems across AI, simulation, rendering, and tooling to enable scalable engine architectures across multiple real-time projects.
- Engineered C++ systems integrating rendering, simulation, AI and tooling within Unreal Engine, OpenGL and custom frameworks to enable unified, cross-system engine architectures.
- Developed procedural systems (fluid interaction, L-system plant growth, hair simulation, environment generation) to enable dynamic, data-driven content generation.
- Built engine tools and pipelines using C++, Python, OpenMaya API, Qt, NGL, CMake, Git and TDD to improve development efficiency, reliability and scalability.
- Created RenderMan, HLSL, OSL rendering to support real-time and offline simulation workflows.
- Applied modular architecture, version control and scalable system design principles to ensure maintainable, production-ready engine codebases.
- Implemented Behaviour Tree AI systems for NPC decision-making to enable complex, modular, and extensible agent behaviours.

GAMES TOOLS DEVELOPER | Various Projects 05/2025–PRESENT

- Developing **Harvy 2**, a real-time procedural plan growth and farming system to enable faster creation of complex simulation-driven, player-interactable and environment-aware gameplay.
- Delivering **Towers**, a platforming game to demonstrate full production lifecycle competence.

FREELANCE VR PROGRAMMER | Bournemouth University 07/2023–01/2024

- Engineered a VR physiotherapy system to enable real-time tracking of rehabilitation movements.
- Developed VR tracking system to convert motion into measurable gameplay progression metrics.
- Delivered a user-ready VR application to an external brief for clinical usability.

FLUID SIMULATION RESEARCHER (FrankenSponge) | Bournemouth University 06/2022–10/2022

- Wrote a dissertation on the topic of "Real-Time Multiple Fluid Simulation for Games" to further my understanding of fluid simulations in a game context that allows for player interaction.
- Researched real-time fluid simulation to identify implementations for gameplay integration.
- Implemented C++/Niagara effects interaction to enable player interaction with simulated fluids.

UNREAL TOOL DEVELOPER (Unreal VR Template) | Bournemouth University 03/2022–06/2022

- Developed a C++ Unreal Engine Template for VR projects, to accelerate VR production pipelines, expanding on the default options provided by the engine.
- Used research on VR to create implementation that facilitates best practice, including challenges relating to motion sickness and diverse player-side control options.

PIPELINE LEAD (Slug Game) | Bournemouth University 02/2022–03/2022

- Architected pipeline systems to enable stable collaboration and version-controlled development.
- Guided Unreal Engine best practice to improve team delivery quality and code stability.
- Implemented UI and achievement systems to enable player customisation and engagement.

NAVIGATION RESEARCHER & CODER (Villager Navigation) | Bournemouth U. 09/2021–02/2022

- Researched and evaluated various pathfinding techniques to identify suitable architectures.
- Built NavMesh and A* systems to enable large-scale, behaviour-driven agent navigation.
- Utilised QT to create an OpenGL context with UI, mouse controls, shaders and 3D scene.
- Implemented GPU optimisations to support high-volume agent rendering.
- Applied TDD and CMake to deliver scalable, maintainable engine systems.

EDUCATION

MSc degree in Computer Animation Visual Effects, 2.1 (Merit) 09/2021–10/2022
Bournemouth University | Bournemouth
Modules: Animation Software Engineering | Group Project | Simulation and Rendering | CGI Tools | CGI Techniques | Pipeline & Technical Direction | MSc Cave Master Project

BA degree in Computer Animation Technical Arts, 1st (with Honours) 09/2018–07/2021
Bournemouth University| Bournemouth

QUALIFICATIONS

Level N3 – Japanese Language Proficiency Test| The Japan Foundation 12/2025
Level 1 – Extended – Passport to Enterprise and Employment | SFEDI Awards 10/2025
Level 1 – Enterprising Skills & Employability | SFEDI Awards 10/2025
Level 1 – Understanding Enterprise | SFEDI Awards 10/2025

REFERENCES

Available upon request.