LIAM VIADER MOLINA

Gameplay & Systems Engineer | Generative AI

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PROFILE

Gameplay & Systems Engineer, Ranked **1st in my class**, specialized in the design and implementation of complex game systems and core mechanics. Experienced in integrating **generative AI** and **multi-agent architectures** within game engines, to drive dynamic systems tailored for **emergent narrative** and **procedural content generation**. Technical demos and further details available at **liamviader.com** .

EDUCATION

Bachelor's Degree in Video Game Design and Development, *Universitat de Girona (UdG)* 09/2020 – 09/2025

- Graduated **1st in class** — GPA: **9.07**/10.
- **18 Honors Distinctions** — Bachelor's Final Thesis: **10**/10
- Relevant coursework: Game Engine Design, 2D & 2.5D Game Development, Mobile Games, Advanced Interaction Techniques (VR & AR), Computer Graphics, Multiplayer Systems, Networking, Cloud Computing, Artificial Intelligence, Computer Vision, Data Structures and Algorithms.

PROFESSIONAL EXPERIENCE

Grup de recerca eXiT, Universitat de Girona, *Software Developer (Internship)* 06/2024 – 09/2024

- Designed and implemented an energy community simulator **from scratch** in **Python**.
- Developed algorithmic modeling of households and automated generation of consumption/production profiles, including mathematical logic for efficient energy and cost distribution.
- Integrated **AI-based optimization techniques** to minimize overall energy costs within the community

SELECTED PROJECTS

AI-Orchestrated Video Game — Generative Multi-Agent System

- Designed and implemented an **LLM-based multi-agent architecture** capable of dynamically generating the **narrative**, **visual**, and **structural game components** from an initial prompt.
- Orchestrated 5 specialized agents via **LangChain** and **LangGraph**, integrating **RAG** for global contextual coherence.
- Optimized agent reasoning using **Chain-of-Thought** and **self-reflection** techniques to improveconsistecy and decision quality.
- Developed a **visual pipeline** using **Stable Diffusion** and **ComfyUI**, including post-processing and a **TinyCNN** classifier trained in **TensorFlow**.
- Programmed a **real-time structured streaming system** with a custom tag parser, enabling seamless integration between the generative model and the Unity client.
- Built a **full-stack architecture** with a **Python core**, a **FastAPI API** layer, and an interactive **Unity client (C#)**.

2D Cooperative Multiplayer Game with an Authoritative Server Architecture

- Engineered a **2D multiplayer** system with an **authoritative server** architecture using **Unity Transport (low-level networking)**.
- Implemented **client-side prediction** and **interpolation** to mitigate latency and synchronize movement and combat.
- Designed a clear **separation between simulation logic and visual representation**.
- Implemented character logic and enemy behavior consistent across clients.

Laboratory Escape — 3D Puzzle Game & Shaders

- Implemented core gameplay systems in Unity (C#), including **reflective raycasts** and a dynamic scaling mechanic affecting environment.
- Developed a full security camera system (player POV) with dynamic multi-view management and scripted transitions.
- Built a visual effects pipeline using **custom shaders in Shader Graph**, including night vision, transformation distortion, analog camera effects and others.
- Designed puzzle state logic and integrated gameplay mechanics while collaborating within a **multidisciplinary team**.

Butterfly Collector AR — Procedural Creatures & Spatial Interaction

- Created a mobile AR experience featuring **procedural texture generation** for butterflies real-world camera input.
- Developed a **spatial positioning and navigation system** via AR Foundation integrated with player interaction.

AI Quiz Generator — Full-Stack Application in Production

- Developed a **cloud-native** application for dynamic quiz generation using **LLMs** with configurable generation parameters.
- Implemented authentication with **Google OAuth and JWT**, along with per-user **rate limiting** to control inference costs.
- Designed a decoupled architecture using **React** on Vercel and **NestJS** deployed on **Google Cloud Run** (serverless with auto-scaling).
- Integrated **MongoDB Atlas** for persistence and **migrated** the infrastructure from **Azure** to **Google Cloud Platform**.

SKILLS

Programming Languages: Python, TypeScript, C#, C++

Game Engines & Systems: Godot, Unreal Engine, Unity, Shader Graph, Unity Transport, AR Foundation, XR-Interaction Toolkit.

Artificial Intelligence: LangChain, LangGraph, OpenAI API, RAG, Stable Diffusion, ComfyUI, Scikit-Learn, Jupyter Notebook

Backend & Cloud: NestJS, Node.js, FastAPI, Google Cloud Platform (Cloud Run), Azure, REST APIs, Arquitecturas Serverless

Databases & Tools: MongoDB, SQL, Git, OAuth, JWT