

Chaouki Mabrouki

Gameplay Programmer | C++ & Real-Time Systems | Unity & Unreal
| AI, Physics, Shaders | Custom Engine Dev

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[LinkedIn](#) | [GitHub](#) | [Portfolio](#)

Summary

Technically versatile and creatively driven programmer with a strong foundation in C++, Unity, and real-time systems. I am passionate about building responsive gameplay mechanics, modular game engines, and intelligent automation. From low-level graphics and shader pipelines to AI decision-making and procedural content, I bring a hands-on, performance-focused mindset. My work blends clean architecture with creative problem-solving—whether optimizing GPU-based terrain rendering or designing state-based enemy AI. I thrive in environments where engineering meets innovation and enjoy pushing the boundaries of what games can do.

Key Skills

- **Programming:** C++, C#, Python, LUA
- **Systems & Concepts:** Game Engine Architecture, Procedural Generation, AI (FSM, Pathfinding), Shader Programming
- **Scripting & Automation:** HTML, CSS, MySQL, OCR Tesseract, Curl
- **Engines & Tools:** Unity, Unreal Engine, OpenGL, ImGui, GLSL, NavMesh, Git
- **Other Tools:** NVIDIA Nsight, Google Test, Spdlog
- **Soft Skills:** Collaboration, Self-direction, Communication, Fast Learner

Key Projects

1 - Dash & Slash: Isometric Rogue-like Game (Unity, C#)

- Designed procedurally generated 3D levels using Cellular Automata.
- Implemented AI systems (pathfinding, finite state machines) for enemy behaviors.
- Developed combat mechanics, wave-based difficulty, and UI systems.
- [GitHub Link](#) Portfolio Project Page

2 - Advanced Shader Programming System (C++, OpenGL, GLSL, ImGui)

- Developed a real-time 3D rendering engine with advanced shaders for procedural terrain, dynamic lighting, and billboard.
- Implemented a Phong lighting model with ambient, diffuse, and specular components for realistic shading.

- Used tessellation shaders and heightmaps for efficient terrain generation, applying distance-dependent LOD to balance quality and performance.
- Designed a modular rendering pipeline (Renderer + RenderState classes) enabling efficient shader and texture state management.
- Integrated a GUI using ImGui for real-time tweaking of rendering parameters (e.g., tessellation level, lighting settings).
- Built billboard geometry shaders to orient objects like trees to always face the camera.
- Optimized rendering performance through CDM-based normals, efficient state handling, and selective detail rendering.
- [GitHub Link](#).
- [Portfolio Project Link](#).

3 - Game Engine Architecture (C++, OpenGL, GLFW, spdlog, Google Test)

- Developed a 3D game engine featuring rendering, user input, and event handling systems.
- Supported textured cubes/pyramids with simple shader-based lighting.
- Used NVIDIA Nsight for shader debugging and performance optimization.
- Built modular systems for logging (spdlog), window/event management, and Google Test-based unit testing for event callbacks.
- [GitHub Link](#).
- [Portfolio Project Link](#).

4 - Fuzzy Logic for Spacecraft Autonomy (MATLAB, Fuzzy Inference System)

- Designed a Fuzzy Inference System (FIS) to guide autonomous satellite maintenance machines.
- System V2 simplified 14 inputs into 6 key features like fuel, orbit, velocity, and satellite status for better decision clarity.
- Used advanced membership functions (gaussmf, gbellmf, pimf) to model uncertainty and nonlinear behavior.
- Output decisions included thrust control and context-aware actions (rendezvous, repair, capture, abort).
- [Portfolio Project Link](#).

Education

De Montfort University, Leicester, UK

BSc (Hons) Computer Games Programming (October 2021 – June 2025)

- Advanced Shader Programming, Game Engine Architecture, Fuzzy Logic & AI, Mobile Robotics
- 3D Modelling, Mobile Games II, Advanced Object-Oriented Programming in C++, Artificial Intelligence for Simulation, Applied Mechanic
- Object Oriented Programming in C++, Physics Engine Programming, Game Prototype Development, Computer Networks.

ABC Horizon, Istanbul, Turkey

BTEC HNC Information Technology (September 2017 – February 2020)

- Programming, Networking, Professional Practice, Database Design and Development, Security, Managing A Successful Computing Project, Website Design and Development, Math for Computing.

Professional Experience

- **Freelance | Self-Employed – Gameplay Programmer – Independent Project, (Jan 2024 - Oct 2024)**
 - Built a custom 3D game engine in C++ with OpenGL and event-driven architecture.
 - Designed rendering pipelines with real-time lighting, LOD terrain, and billboard.
 - Created modular systems for input, rendering, and unit testing using Google Test.
- **French & Computer Science Tutor – INICIO Tutoring School (Aug 2023 – Feb 2024)**
 - Delivered tailored lessons in French and GCSE Computer Science.
 - Designed engaging lesson plans and fostered programming skills.

Additional Information

- **Languages:** Fluent in English, Fluent in French, Fluent in Arabic, Basic Turkish
- **Interests:** Game development, Sports, Programming, AI Programming, Gameplay Mechanics Implementation.