

ASAAD AL BARWANI

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EDUCATION

New York University - Bachelors of Arts, Computer Science & Linguistics

Sept 2022 - May 2026

- Relevant Coursework: Honors Linear Algebra, Computer Graphics, Visual Communication, Data Structures & Algorithms, Applied Internet Technology, Operating Systems, OOP in C++, Computer Systems Organisation, Discrete Math, Mechanics.

WORK EXPERIENCE

Software Engineer & HPC Support Assistant | NYU HPC

Aug 2024 - Present

University HPC Department

Unreal Engine | C++ | Python | Bash

- Contributing to CoreLink, an **open-source low latency C++ networking framework** for high speed research
- Adapting existing Corelink **C++ client to Unreal Engine 5**, integrating it with Unreal Engine's **netcode architecture** and complying with Unreal Build Tool's restraints on STL.
- Rewrote **C++ client Documentation**, improving new user accessibility, usability, and installation.
- Working on setting up **ReFrame for continuous testing** of HPC software on the new cluster.
- Completed **Software Build Automation** project w/ **Spack** and **GitLab CI**, making software installation **up to 20x faster**.

PROJECTS

PROJECT: #####

April 2025-Present

Unannounced Game

C++ | Unreal Engine 5 | 3C's

- Developed a **custom Character Movement Component** to handle **complex physics-based FPS movement** and **server-side movement replication**.
- Wrote a **custom physics-based slide and wall-run** with **custom states and consistent state transitions**, with slide supporting slopes and "slide-hopping" according to designer's specifications
- Documented and exposed key elements to editor/blueprints to enable **fast iteration for game designers**
- Comprehensive wall-running system with **state, velocity, height, and collision checks** designed around player momentum
- Set up an "omni-movement" system for slide and wallrun, allowing **omni-directional slides** and **free-look on wallrun** with curved wall support.

Parkour Movement Demo

November 2024

Parkour Movement for a Scrapped Project

C++ | Unreal Engine 5 | 3C's

- A third-person parkour movement demo with a smooth **wall-cling and wall-jump** mechanic and **root-motion based slide**
- Walljump direction (left/right and up/down) based on camera direction **with respect to wall normal** calculated with **vector projection** (vertical and horizontal)
- Wrote **camera interpolation logic** to ease transitions between the jump and the player's next move

Dawn Engine

April 2024-Present

C++ & SDL2 Based 2D Game Engine

C++ | SDL2 | OOP

- Developing a **custom 2D game engine** in C++ which handles collision, graphics, and more, alongside additional functionality.
- Implemented a **hierarchical scene graph** data structure for organisation & inheritance, allowing for both **ECS & OOP**.
- Implemented recursive **Quadtree** data structure for efficient **collision detection** and resolution, **doubling** time efficiency.
- Managing resources using containers of smart pointers, handling initialization, re-parenting, deletion, and hierarchy.

Kalindis

December 2020-April 2021

Infinite-Scrolling Mobile Game

Godot Engine

- Designed, prototyped, and implemented player movement/basic mechanics, environment interactions, obstacles, and UI
- Calculated and displayed player trajectory with projectile motion calculations
- Implemented Finite State Machine (FSM) to handle player animations, VFX/SFX, and environment interaction logic

LANGUAGES, DEVELOPER TOOLS, AND SKILLS

- **Languages:** C/C++, Git, Python, JavaScript, Node.js, Bash, Shell, Java, GDScript, Assembly, Make/CMAKE.
- **Technologies:** Unreal Engine, Godot Engine, GitHub, SDL2, Docker, RHEL, Wireshark, Singularity, SLURM.
- **Concepts:** Software Engineering, **Gameplay Programming**, Engine Programming, HPC Administration, Offensive Cybersecurity, Game Design, Level Design, Low-Level Development.