

# ASAAD AL BARWANI

New York, NY (Open to Remote/Relocation) | asaad[dot]barwani[at]gmail[dot]com  
[linkedin.com/in/barwani](https://www.linkedin.com/in/barwani) | [barwani.eu.org](https://barwani.eu.org)

## EDUCATION

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

Sept 2022 - May 2026

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

## EXPERIENCE & PROJECTS

### Dawn Engine

April 2024-Present

C++ & SDL2 Based 2D Game Engine

C++ | SDL2 | OOP

- Developed a custom 2D game engine in C++ which handles collision, graphics, and resources, alongside additional functionality.
- Utilising **SDL2 Library** for rendering, defining object dimensions, and finding delta-time for **framerate independent logic**.
- Implemented a **hierarchical scene graph** data structure for organisation & inheritance, allowing for both **ECS & OOP**.
- Implemented recursive **Quadtrees** data structure for efficient **collision detection** and resolution, **doubling** time efficiency.
- Resolved collision using **displacement resolution** and **raycasting**, ensuring **high speed collisions** are handled appropriately.
- Utilised **OOP** principles for node implementations/inheritance & **virtual/pure virtual** methods for inherited/abstract nodes.
- Managing resources via vector of **unique\_ptr**'s of children owned by a parent node, as well as using other **STL containers**.

### Co-Founder & Developer | Nahar Studios

Dec 2019 - Present

Indie Game Development Studio

Godot Engine | Git

- Co-founded *Nahar Studios*, a game studio comprised of diverse and talented designers, programmers, artists, and musicians.
- **Gameplay Programming** involving Player/NPC Movement & Attacks, Physics interactions, Level Environment, etc.
- **Asset Integration** and collaboration with **artists and designers** (Animations/VFX, SFX, Adaptive Music, UI/UX integration).
- **Finite State Machine** (FSM) systems for player characters and **Non-Player Character (NPC) AI** with associated logic.
- Led and assisted in **Game/Level Design** for 2D platformers, metroidvanias, puzzle, top-down, and mobile games.
- Working with two other developers, **coordinating and assigning tasks** for each member and collaborating on larger milestones.
- Version Control with **Git/GitHub** utilising **Git Flow Branch** Strategy.

### Lab Member | OSIRIS Lab

Aug 2023 - Present

Offensive Cybersecurity Lab

Python | Git | C++

- Developed two game-based CTF (Capture-The-Flag) challenges for NYU's annual CSAW CTF qualifying and final rounds.
- "Impossiblebrawler!" - challenge involving **binary decompilation** and modifying game code to solve. **180 solves, 1600 teams**.
- "R.C.E!" - Remote Code Execution challenge with an insecure web-hosted leaderboard. **6 solves, 55 teams**.
- Participated in several CTFs, leveraging knowledge of **low-level & cryptographic vulnerabilities** to solve challenges.

### Finalist | SC23 Student Cluster Competition (SCC)

Nov 2023

HPC Cluster Competition

Bash | Wireshark | Python

- Led **NYU's first** Student Cluster Competition (SCC) finalist team as captain at the 2023 Supercomputing Conference.
- Built and ran an HPC cluster at the conference for the competition, leveraging **SLURM** and **Ansible** for task-management.
- Utilized **Python CM scripts**, **Bash** scripting, **Docker** & Singularity Images, and **Parallel Computing**.
- Responsible for MLPerf benchmark, network security, Mystery Application, Reproducibility Report, and team management.

### IT Helpdesk Assistant | NYU Stern School of Business IT

Dec 2022 - May 2023

University IT Department

- Handling Tier 1 help desk escalations through tickets and phone. Providing support and troubleshooting of IT-related issues.

## LANGUAGES, DEVELOPER TOOLS, AND SKILLS

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