

# Mohammad Mossa

COMPUTER SCIENTIST

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## Summary

B.Sc. candidate in computer science with over 4 years of industry experience in software engineering, specializing in game development. I have a proven track record of delivering high-quality software solutions, particularly in network and gameplay programming. My strong background in Math and Physics, acquired through my degree, complements my technical skills.

My journey in game development began in 2016 with Unity, where I honed my foundational skills. In 2017, I transitioned to Unreal Engine and have been leveraging its capabilities ever since. My self-taught expertise in game development underscores my ability to quickly learn and adapt to new technologies and challenges. To date, two games I worked on were successfully released.

## Work Experience

### Generalist Programmer

*The New Face*

#### IMMERSIVE E-COMMERCE EXPERIENCES

*Jul 2024 - Present*

- Resolved various **multiplayer-related bugs** caused by **race conditions**.
- Addressed **matchmaking issues** that resulted from design flaws, ensuring players could successfully matchmake.
- Updated the **GeForce Now SDK** to the latest version and fixed the **inbound messaging feature**, enabling clients to send messages to the GFN application.
- Optimized the **action zones feature** for mobile devices, ensuring the virtual keyboard displays when focusing on an editable text box in GeForce Now.
- Provided support for extra features that come with the GeForce Now SDK, and were not previously implemented.
- Customized the **Common Loading Screen plugin**, originally from Lyra, to control the **Movie Player** according to our needs.
- Automated the **integration process** of the GeForce Now SDK into our packaged builds, eliminating the need for manual intervention.
- Adapted quickly to the **GeForce Developer Portal** and utilized **debug seats** to troubleshoot our experiences on the GFN platform.
- Enhanced **testing inclusivity** by fine-tuning the client's GeForce Now SDK.
- Refactored parts of our core **codebase** to improve **maintainability** and **scalability**.
- Provided consultation on **design-related matters** for implementing new systems.
- Upgraded the **engine** and associated **plugins** to the latest versions, ensuring compatibility with the GeForce Now SDK.

### Junior Network Programmer

*HEXWORKS - CI Games*

#### LORDS OF THE FALLEN

*Dec 2022 - Jun 2024*

- Made the game work from the **networking perspective**, while dealing with numerous aspects of the game that include but are not limited to:
  - **Matchmaking:**
    - ★ Revamped our **Invasion Matchmaking System** while utilizing **Online Beacons**.
    - ★ Provisioned a **Custom Matchmaking by Key System**.
    - ★ Fixed our **Ping Calculation System**, ensuring clients are matchmade with good ping to the server.
  - **Customization System:** Synchronized character customizations by **custom serialization & compression** of data over the network to achieve atomic replication of data types unsupported by the Replication System.
  - **Save/Serialization System:** Fixed vague game breaking issues that were caused by improper serialization of game state.
  - **Gameplay Ability System:** Fixed several gameplay abilities not performing properly over the network, and made a few.
  - **Character Movement & Animation:** Various Game & Engine level fixes to enhance the way characters move and animate.
  - **Level Streaming:** Various Game & Engine level fixes to ensure game state is synchronized and resilient against level streaming under harsh network conditions.
  - **Level Design:** Implemented level design oriented tools to **enhance the workflow** of the level design team.
  - **Audio:** Fixed countless audio bugs, where audio wasn't played properly across the network for all connections of interest.
  - **UI:**
    - ★ Fixed visually breaking issues with different in-game menus, and handled a bunch of memory leaks.
    - ★ Provisioned a dedicated, self-contained **multiplayer settings menu**.
    - ★ Provisioned **user-facing text localization**.
- Profiling and optimizing game's **network bandwidth** using **Networking Insights**:
  - Effectively identified and disabled replication on many Objects and properties that didn't need it.
  - Effectively skipped data replication for connections that were able to conclude that data from elsewhere.
  - Utilized **Oodle Network** plugin to manually compress serialized network data for improved player experience.
  - Seamlessly moved bandwidth-unfriendly data to Objects that replicate less frequently, and persist longer.
- Profiling and optimizing game's **server CPU performance** usage using **Timing Insights**.
- Provisioned editor tools, that simplified and enhanced my workflow:
  - Made a simple editor tool that scans all our project's Blueprint assets, and inclusively finds potentially optimizable replicating Objects.
  - Made a simple editor tool that triggers serialization on Blueprint assets, so that references to Gameplay Attributes can be seen in the reference viewer, to better understand how to optimize their owning Attribute Sets.

## Junior Programmer

NOWWA

### BULLETVILLE

Jan 2022 - May 2022

- Implemented a **game-mode based Spectating System**.
- Implemented **Killcam System** for instant replays.
- Collaborated with the design team to implement and refine game features based on playtesting and user feedback.
- Contributed to building the project's **Style Guide** and helped organizing its hierarchy.

## Novice Gameplay Programmer

AXC Games

### ANAREA BATTLE ROYALE

Jul 2019 - Aug 2020

- Implemented **Multizone Spawn System** inspired by the one in Ring of Elysium.
- Implemented **Loot Randomizer System**.
- Developed an **Inventory System** to manage player items and equipment.
- Created and optimized various **gameplay mechanics**, including player movement, shooting, and health systems.
- Integrated third-party **APIs** for analytics and player feedback.
- Collaborated with the **design team** to implement and refine game features based on playtesting and user feedback.
- Worked on **network synchronization** to ensure smooth multiplayer gameplay.
- Assisted in **debugging** and resolving performance issues to enhance game stability and performance.
- Participated in **code reviews** and provided constructive feedback to improve code quality and maintainability.
- Contributed to the development of the game's **user interface**, including HUD elements and menus.

## Skills

<b>Industry Knowledge</b>	Software Engineering, Network Programming, Gameplay & Systems Programming
<b>Programming</b>	C/C++, C#, Java, Dart, Python, Squeak/Smalltalk
<b>Software</b>	Unreal Engine, Unity, Perforce, Git, Plastic SCM, TortoiseSVN
<b>Languages</b>	Arabic (native), English (C1), Hebrew (C1)

## Education

### Technion - Israel Institute of Technology

Haifa, Israel

#### B.SC. IN COMPUTER SCIENCE

Mar 2020 - Mar 2025

- Took key courses including but not limited to: Operating Systems, Algorithms, Data Structures, and Competitive Programming.
- Worked as an Academic Tutor for courses including: Introduction to Computer Science, Combinatorics for CS, and other introductory math courses.
- Dean's Excellence List.

## Projects

### Android Application

Technion, Haifa, Israel

#### YALLA NEGEV

Summer 2024

- Developed an Android application that aims to collect reliable data about service availability in the Negev region to advocate for government support.
- Implemented key features such as user registration/authentication, data submission, and push notifications.
- Set up the Firebase/Firestore database to enable seamless communication between the app and the backend.
- Designed a user-friendly interface for data collection and visualization.
- Conducted user testing and feedback collection to improve application usability.
- Technologies: Flutter, Dart, TypeScript, Firebase & Firestore.

### Internet of Things Project

Technion, Haifa, Israel

#### PERSONAL TRACKING BOARD

Winter 2024

- Developed an IoT-based personal tracking board that helps track the progress of user-created assignments per board user.
- Implemented NTP clock synchronization to ensure accurate timekeeping across the board.
- Handled HTTP requests to the Firestore database to synchronize data and display accurate assignment status on the board.
- Utilized multithreading on the ESP32 to perform HTTP requests on a separate thread, ensuring the display of the board never hangs.
- Technologies: C, ESP32, Arduino, HTTP & NTP Protocols.

## Other Activities

- Since 2022 I have been writing Game Development Blogs and posting them on my site, [wizardcell.com](https://wizardcell.com). The site has become a popular resource within the community with 1k unique visitors a month.
- I took part in [#notGDC 2023](#), a free online "un-conference", where I gave a talk on ["Unreal Online Multiplayer Tips and Tricks"](#).