Mohammad **Mossa**

COMPUTER SCIENTIST

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Summary

B.Sc. candidate in computer science with over 2 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

Junior Network Programmer
HEXWORKS - CI Games, Remote

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, Remote

BULLETVILLE
Jan 2022 - May 2022

- Implemented a game-mode based Spectating System.
- Contributed to building the project's Style Guide and helped organizing its hierarchy.

Novice Gameplay Programmer
AXC Games, Remote

ANAREA BATTLE ROYALE
July 2019 - Oct 2019

- Implemented Multizone Spawn System inspired by the one in Ring of Elysium.
- Implemented Loot Randomizer System.

Skills

Industry Knowledge	Software Engineering, Network Programming, Gameplay & Systems Programming
Programming	C/C++, C#, Java, Dart, Python, Squeak/Smalltalk
Software	Unreal Engine, Unity, Perforce, Git, Plastic SCM, TortoiseSVN
Languages	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.
- Two courses away from graduation.
- Worked as an Academic Tutor for courses including: Introduction to Computer Science, Combinatorics for CS, and other introductory math courses.
- Dean's Excellence List.
- GPA: 87.

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. 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".