

## Summary

Performance-focused Unity Developer with a background in Electronics Engineering. Specialized in mobile game architecture, SOLID principles, and GPU/CPU optimization (Instancing, Shaders). Experience shipping full-lifecycle projects to Google Play with a focus on clean, scalable code and high-performance gameplay systems. Developed scalable mobile architectures designed to handle high-volume user bases on low-end devices.

## Skills

- *Languages: C#, HLSL (Shaders), Python, MATLAB, JSON/CSV parsing.*
- *Unity Development: Animation Rigging (Inverse Kinematics), NavMesh AI, Finite State Machines (FSM), Physics API, UGUI/UI Toolkit.*
- *Graphics & Optimization: Addressables, Compute Shaders, GPU Instancing, Draw Call Reduction, Memory Management (Lazy Loading), Profiler & Frame Debugger.*
- *Services & Backend: Firebase (Auth, Remote Config)*
- *Tools: Firebase Console, Blender (3D Modeling), Git/Version Control, Visual Studio.*
- *Core Concepts: Software Architecture (SOLID Principles, Design Patterns), OOP, Linear Algebra (Vector Math), Data Structures, Algorithms.*
- *Languages: English, Arabic*

## Projects

**Strategic Cannon Puzzle (Grid-Based Mobile Game)** | Unity, C#, Editor Scripting [\[Github\]](#)

- **Custom Level Design Tool:** Developed a robust Unity Editor Window (LevelMakerTool) with a paint-based grid interface and ScriptableObject serialization. Reduced level creation time by **90%** (**from ~20 minutes to under 2 minutes per level**), allowing for rapid content iteration and balancing.
- **Rendering Optimization:** Utilized MaterialPropertyBlock to handle dynamic color changes for blocks and cannons. This approach avoided creating new Material instances at runtime, preventing memory spikes and preserving draw-call batching for optimal mobile performance.
- **Gameplay Logic & Architecture:** Engineered a modular system decoupling GridManager, InventoryManager, and SlotManager. Implemented complex grid manipulation logic (column shifting, recursive block fusing) and smooth tweening animations using DOTween.
- **Live Operations & Backend Integration:** Integrated **Firebase** to handle Anonymous Authentication for seamless user onboarding and implemented Remote Config to manage and balance daily coin rewards dynamically without requiring app updates.

- **Inventory System:** Designed a dynamic inventory system supporting linked entities (multi-slot items) and logic for adjacent slot detection, sorting, and merging mechanics.

### 3rd-Person Football Mobile Game | Unity, C#, HLSL, Blender

- Engineered a GPU-based crowd rendering system, replacing standard SkinnedMeshRenderers with GPU Instancing and Animation Texture Baking to render thousands of fans with minimal draw calls.
- Programmed physics-aware AI for goalkeepers that calculates ball velocity trajectories to determine intercept states, blended with standard Finite-state machine logic for player positioning and man-marking.
- Utilized Procedural Animation (IK) to solve gameplay-visual discrepancies, ensuring precise contact points between player models and the ball physics object during high-speed interactions.
- Built robust data systems for the "Manager Mode" dashboard, handling save states for team lineups, economy (player transfers), and unlockable content.

[Link to Game play Video](#)

### Tri-Language Dictionary Translator | Unity, C#, UI Integration

- Engineered a memory-efficient audio system using a Lazy Loading pattern; reduced runtime memory footprint by streaming audio clips from disk on-demand rather than pre-loading the entire library into RAM.
- Developed a flexible data structure to parse raw CSV datasets into custom C# objects, enabling bidirectional search capabilities (allowing users to query a word in any of the three languages to retrieve the corresponding translations).
- Owned the full product lifecycle, iterating on UI/UX designs based on user feedback to create a responsive, intuitive interface, resulting in over 1,000 organic downloads on the Google Play Store.

[\[Link to Google Play Store\]](#)

## Experience

2021-Present

### "Squaresum Games - Unity Developer (Indie)

- Managed the full product lifecycle for multiple mobile titles, handling release management, App Store Optimization (ASO), and post-launch updates based on crash analytics.
- Integrated monetization strategies (AdMob/Unity Ads) and utilized Google Play Console metrics to track user retention, successfully scaling a product to 1,000+ organic users.
- Translated technical constraints into design solutions, ensuring applications ran at stable framerates on low-end Android devices while maintaining visual fidelity.

## Education

2014-2019

**Nile University Giza, Egypt** - *Bs, Communication and Electronics Engineering*

- Graduated with 3.52 GPA
- Dean's Honor List