# AUGMENTED REALITY GALAGA

FEATURES

- 360-DEGREE COMBAT: EXPERIENCE IMMERSIVE FIRST-PERSON COMBAT WITH THE ABILITY TO SWIVEL IN ANY DIRECTION, TRACKING AND DEFEATING ENEMIES ALL AROUND YOU.

- INTUITIVE CONTROLS: SIMPLY TAP THE SCREEN TO SHOOT AND ACCUMULATE POINTS, MAKING IT EASY TO FEND OFF ATTACKING SPACECRAFT WITH RESPONSIVE CONTROLS.

- AUGMENTED REALITY ENVIRONMENT: ENJOY GAMEPLAY IN YOUR OWN SPACE WHILE OBSERVING YOUR SURROUNDINGS IN REAL-TIME, SEAMLESSLY INTEGRATING THE GAME INTO YOUR ENVIRONMENT.

- DYNAMIC ENEMIES: FACE A VARIETY OF ENEMY TYPES WITH UNIQUE BEHAVIORS AND ATTACK PATTERNS, KEEPING THE GAMEPLAY CHALLENGING AND ENGAGING.

- IMMERSIVE SOUND EFFECTS: ENJOY HIGH-QUALITY SOUND EFFECTS, ESPECIALLY REALISTIC AND POWERFUL EXPLOSION SOUNDS, THAT ENHANCE THE OVERALL GAMING EXPERIENCE.

- SPECTACULAR EXPLOSION ANIMATIONS: WITNESS DETAILED EXPLOSION ANIMATIONS THAT ADD A VISUALLY CAPTIVATING ELEMENT TO THE INTENSE COMBAT SCENES.

- IPHONE COMPATIBILITY: ENJOY SEAMLESS GAMEPLAY WITH FULL SUPPORT AND OPTIMIZATION FOR IPHONE DEVICES.

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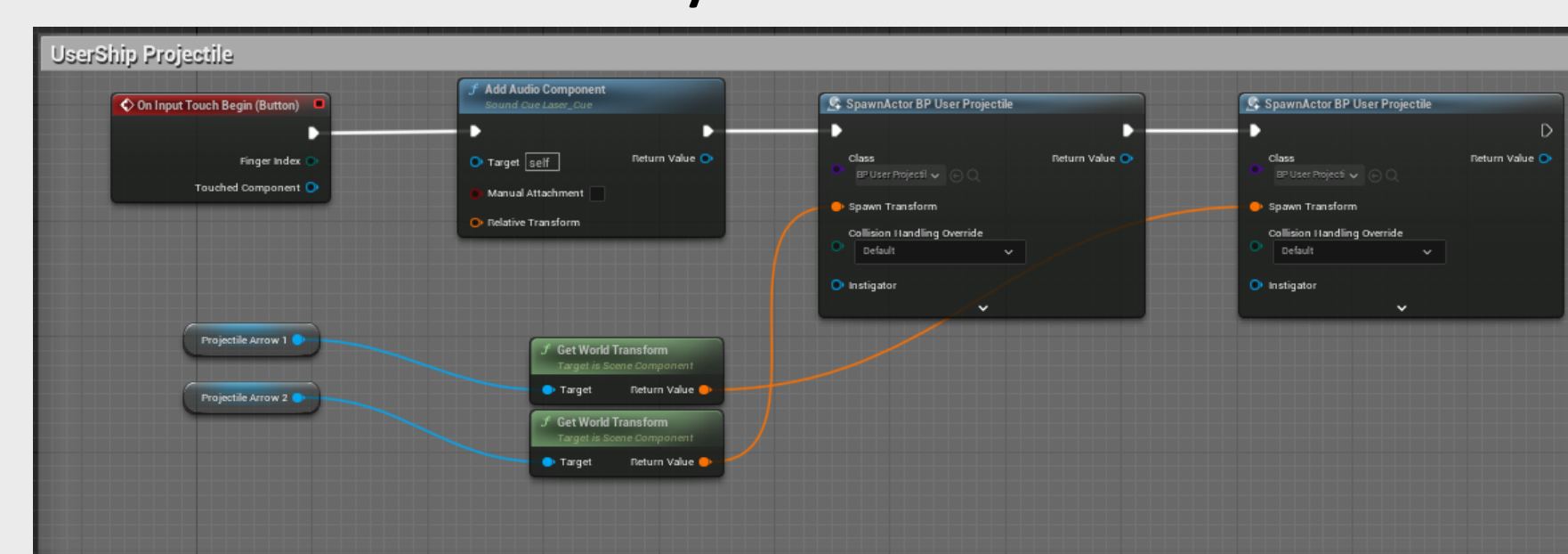
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AR Galaga is an augmented reality (AR) recreation of the classic arcade game, Galaga, designed exclusively for iPhone users. Dive headfirst into an epic space battle where your own surroundings become the battleground. Transform your living room, backyard, or any space into a thrilling arena where waves of alien attackers are just waiting to be vanquished!
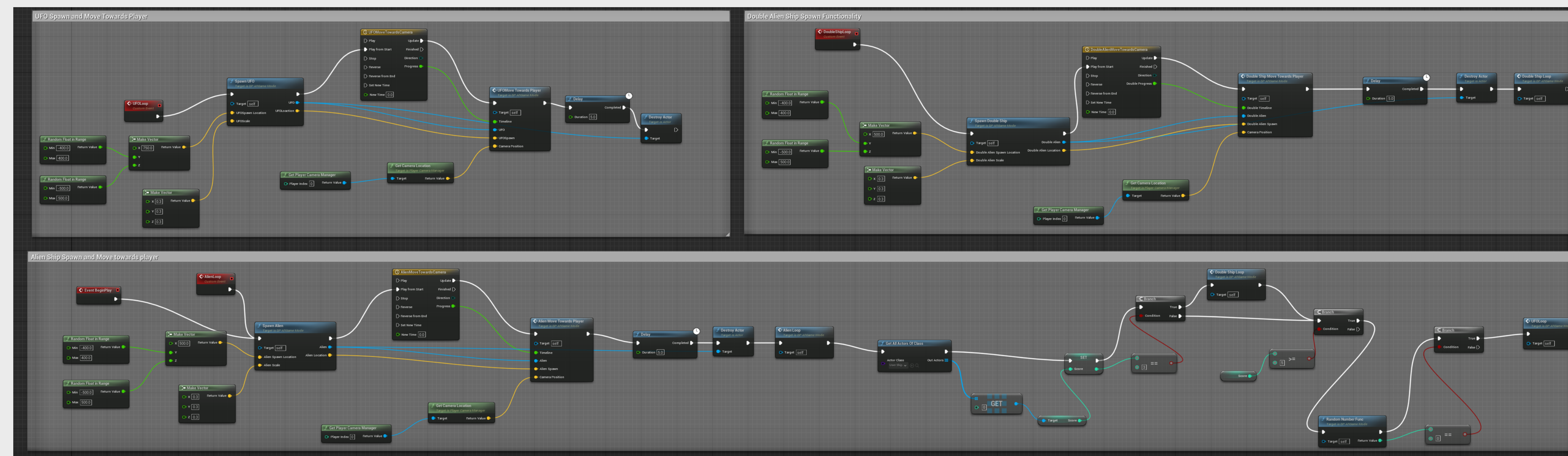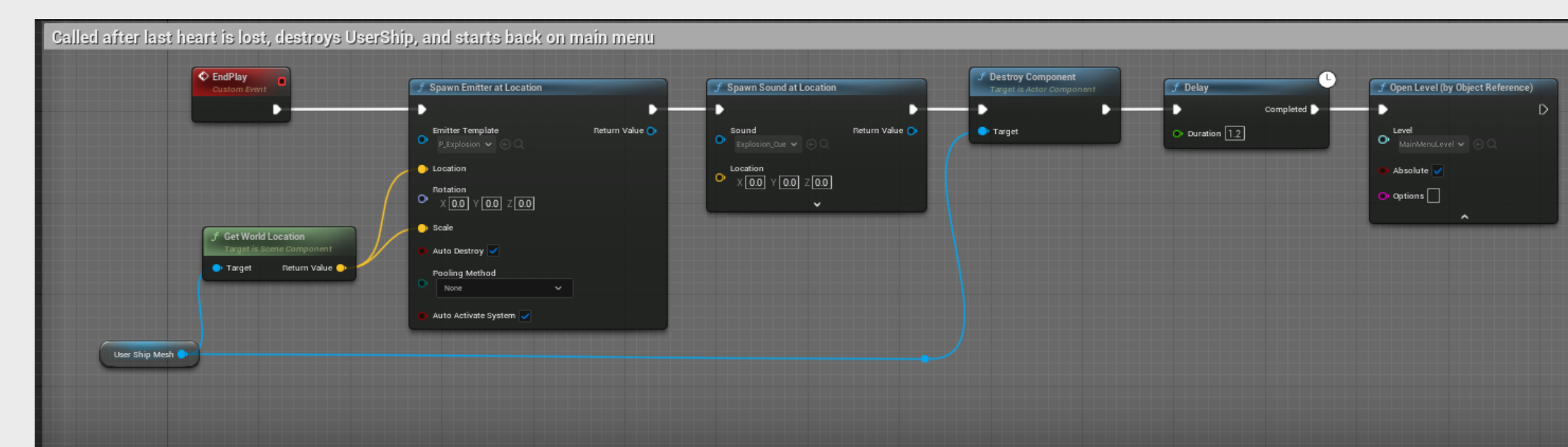

User ship spawning mechanism with three different ship types. One UFO ship type that shoots projectiles at user ship, one alien ship and one double alien ship. All these different attacker ships fly at the UserShip and explode on contact with the UserShip.
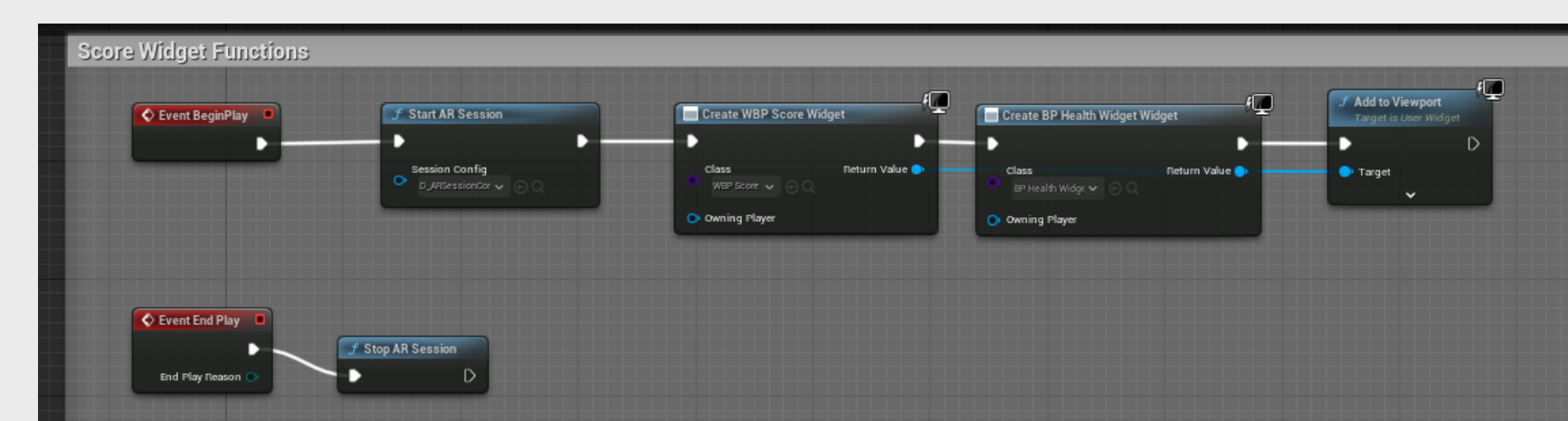
Scoring widget mechanism. The score widget counts how many attacker ships have been destroyed.

UserShip health heart mechanism. This mechanism allows the UserShip to have three lives (hearts) and when the attacker ship destroys the UserShip three times the game ends.
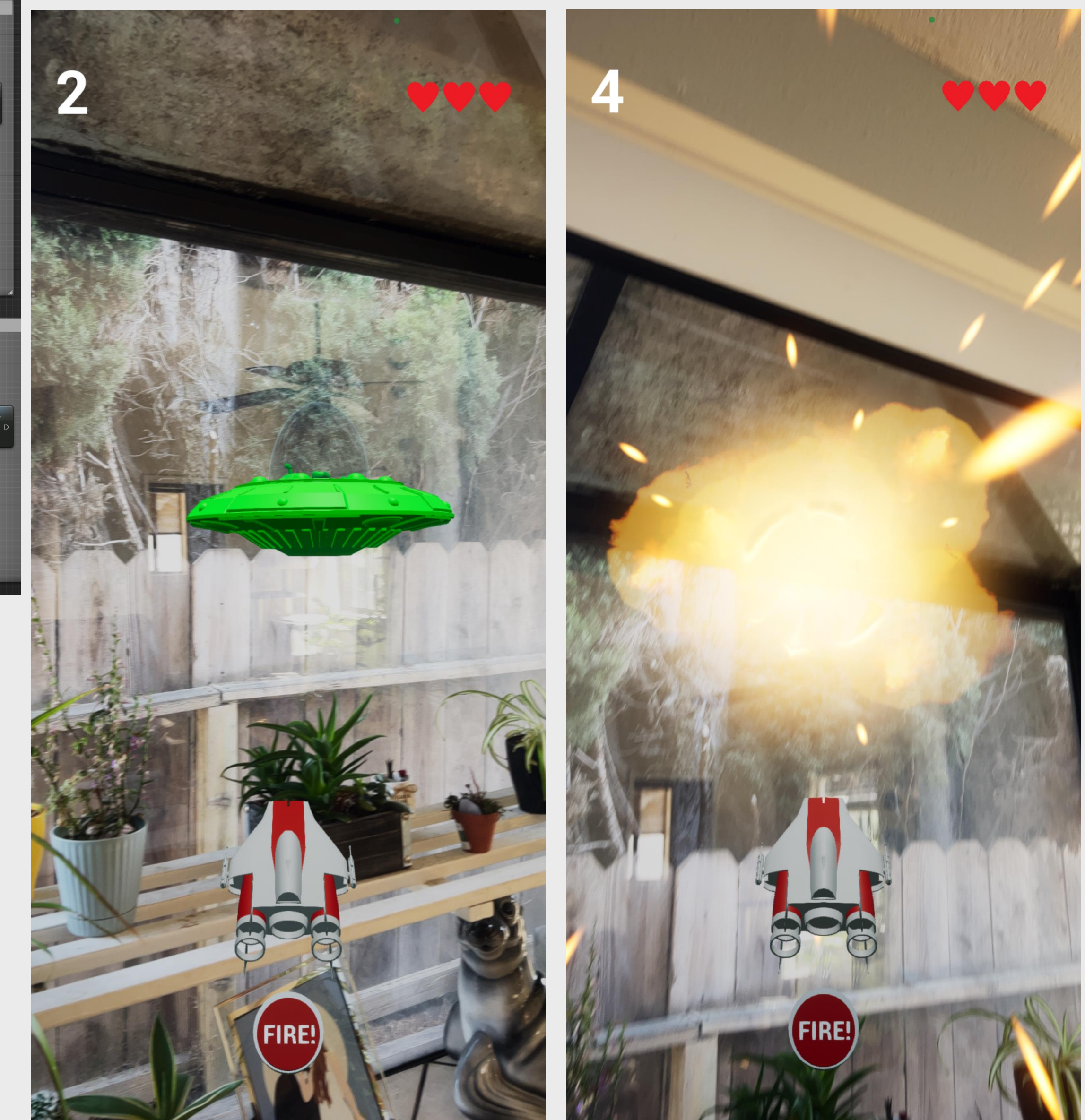

UserShip Projectile mechanism. This mechanism allows the UserShip to shoot projectiles at the attacker.

The alien ship is flying at the UserShip and attempting to destroy it.

The UserShip has destroyed the attacker ship.

TECHNOLOGY
- Unreal Engine 5.4
- Xcode 15

IMPLEMENTATION

Regarding choosing a game engine, we discussed the pros and cons of Unreal Engine and Unity, and we ultimately decided to move forward with Unreal Engine because we felt it would lend us more sophistication working in three dimensions. This greater level of sophistication came at the expense of a presumably larger learning curve, but we all accepted a learning curve would be necessary to overcome on any given platform.

Unreal Engine provides filetypes in the form of Blueprints (among others), which strongly complement C++ code with a visual scripting interface. Once Blueprints are assembled and combined with different player and pawn classes, UI widgets, and levels, the code can be built and run via Xcode with ARKit to test the app on an iPhone running iOS 15 or later. Our process largely involved creating and modifying blueprints, compiling in Unreal Editor, building in Xcode, and deploying on iPhone.

DESCRIPTION

Augmented reality is a new technology that seamlessly inlays virtual game elements into the real world. It creates an immersive experience where, while players are whisked to fantastical realms, they're able to interact with their immediate surroundings. This new way to play allows users to experience video games in an entirely new way. Galaga is a classic arcade game, originally dating back to 1981, now developed for augmented reality to bring timeless charm and excitement right into a user's surrounding environment. This classic arcade game, which once made great waves in the arcade gaming industry, could now be considered a marriage of nostalgic gameplay with the latest technology in AR.

In this re-imagined AR version of Galaga, players are put into the seat of a ship to fend off waves of attacking alien spacecraft. This includes green UFO ships that dash toward the player's craft, introducing an element of rush and peril. There's also the addition of double UFOs, green and red, that pose a bigger threat as they too try to ram into the player's ship. Survival and skill are important as the complete elimination of enough attacker ships brings on a third, different kind of UFO ship. This rather formidable opponent is distinguished by having the ability to fire lasers, and the player must exercise ship maneuvering skills to avoid these deadly beams.

Each player has three hearts, showing the three lives a player has and which need to be conserved as one goes through the game. The top left of the screen features a running score with respect to the number of attacker ships destroyed by the player. The aim is to get as high a score as possible.