# ABOVE THE GRAVE

By : Daniel Barry, Parth Sharma, Drew Barnes

# RECAP

- Above the Grave is an AR mobile card game
- It utilizes Unity with a Vuforia plugin to add AR elements into the game.
- The game utilizes a phone camera to show characters/actions/animations all within the rules of its trading card game elements.
- This allows for each trading card will come to life in our app and will visualize to the user their choices within the game.
- Additionally other trading card functionality is available outside of the game allowing for a comprehensive and versatile TCG experience.

01

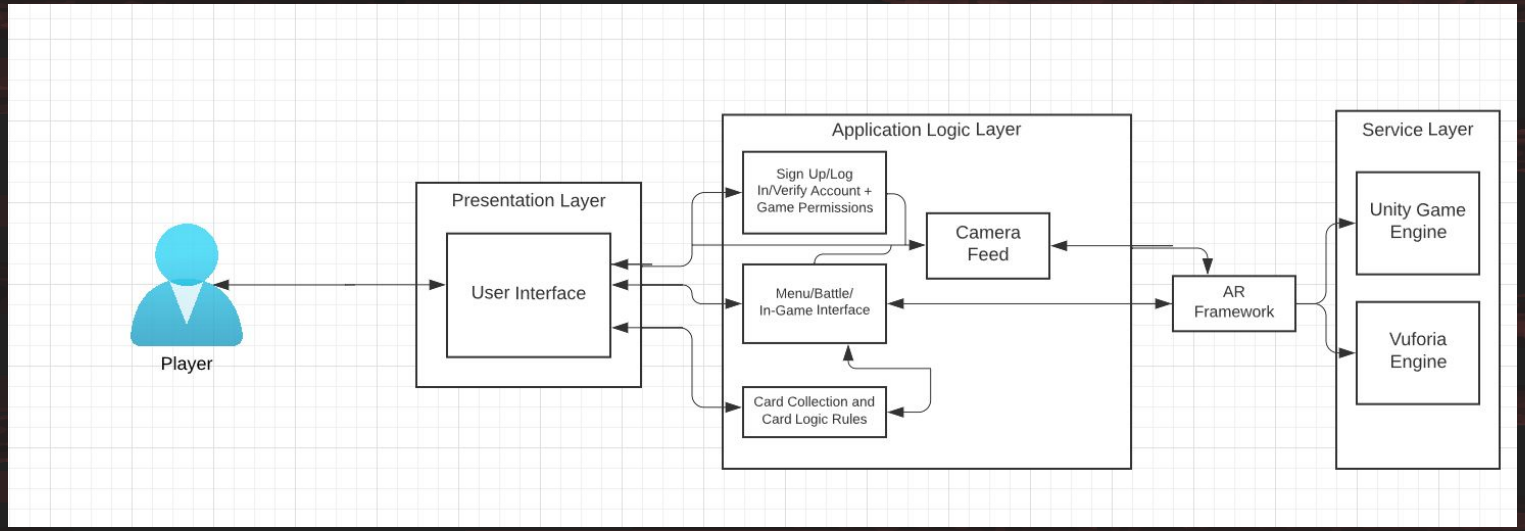
# SYSTEM ANALYSIS

# SYSTEM OVERVIEW

The system of Above The Grave is an augmented reality (AR) card game that allows players to engage in battles using physical cards and their camera-equipped mobile device. The game is designed for Android and iOS devices and heavily relies on the user's phone camera to create a sense of immersion via animations/effects while playing this trading card game.

The system follows a three-tier architecture, with a presentation layer, a logic layer, and a storage/data access layer. The reasoning behind this architecture choice is its organization and reliability.

# SYSTEM DIAGRAM



# ACTOR IDENTIFICATION

## Player

The Player is the primary actor of the system. They use the Above The Grave mobile app to capture images of physical cards with their phone camera and engage in battles with other players. The Player can create a profile, manage their card collection, view their game progress, and change various options within the game.

## Application Logic

The Application Logic is an internal actor of the system, responsible for managing game logic-related tasks. Application logic has access to Unity's backend and can perform tasks such as enforcing game rules and procedures, managing game events, and handling user inputs.

## Augmented Reality (AR) Framework

The AR Framework through Unity is an external actor of the system, responsible for rendering virtual card animations and effects on top of physical cards. The AR Framework is integrated with the mobile app and handles tasks such as image recognition, card tracking, and virtual object placement. This is done through both Unity and Vuforia which is imported into the Unity project.

## Database

The Database (aka the storage/data model) is an external system actor responsible for storing and retrieving game-related data. The Database is integrated with the game engine and handles tasks such as storing player profiles, card collections, and game progress data. The Database also manages game event logs and statistics.

02

# DESIGN RATIONALE

# ARCHITECTURAL STYLE

- Emphasis on Organization and Reliability
- Three Tier Architecture
  - Client: Translates all the tasks the user needs
  - Application logic: Manage areas such as selecting a card before entering the Battle UI and scripts to make moves/attacks
  - Storage/Data Model: Consists of data such as user’s card collection and private information user enters when signing up.

# DESIGN PATTERN

- State Machine Design Pattern
    - Helps break down large tasks into independent smaller tasks
    - The idea is a machine can run different states (Menu State, Game State, GameOver State)
- StateMachine: holds and updates our scripts
- BaseState: implements some virtual functions that will be later overwritten

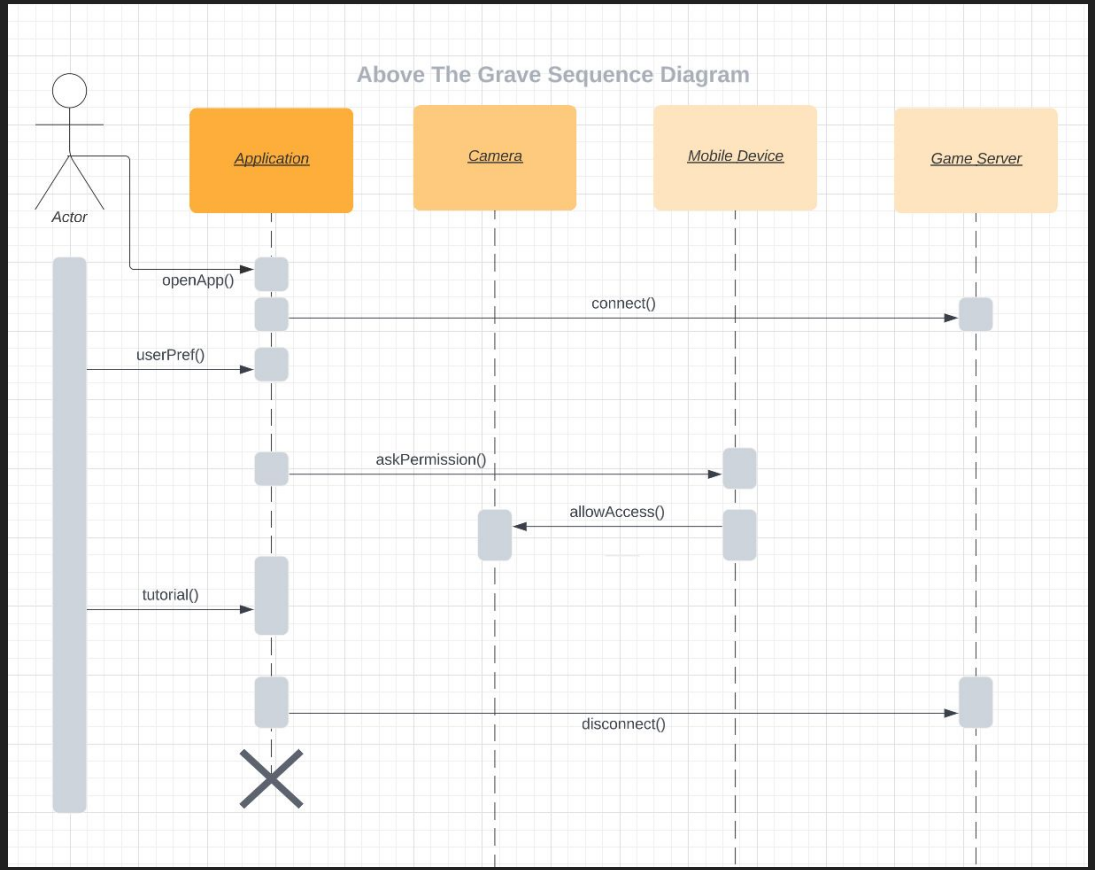
# FRAMEWORK

- Unity
  - Most popular cross-platform game engine
  - Supports multiple platforms to create 3D games
  - Free to Download
  - Intuitive User Interface

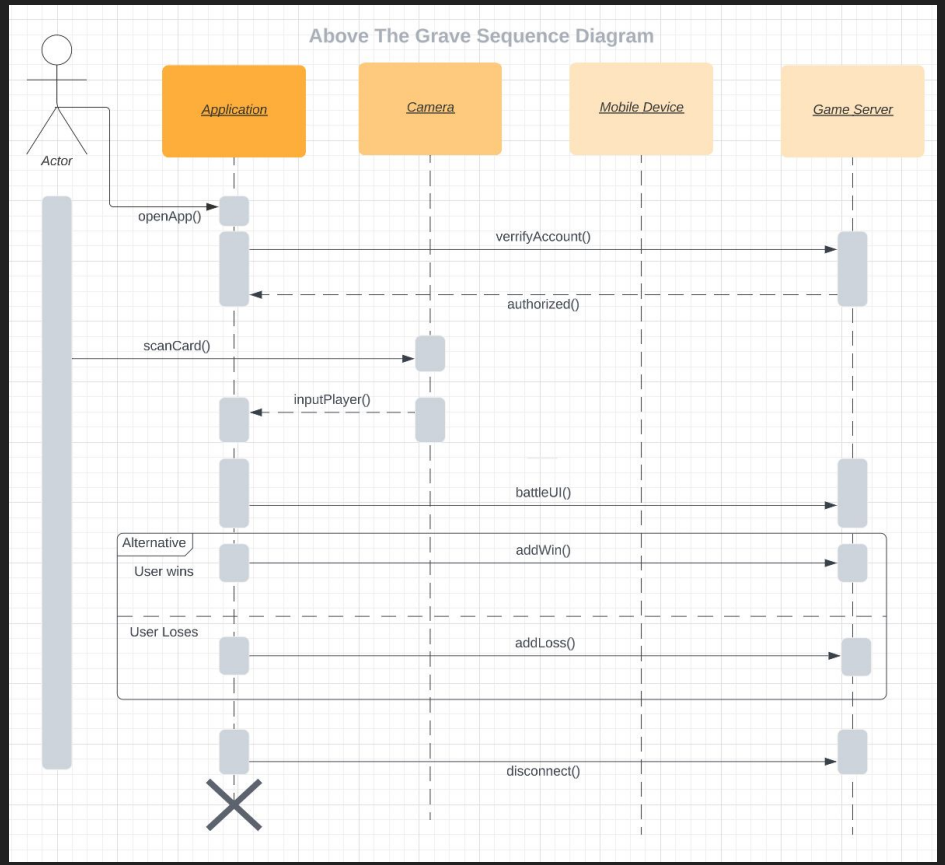
03

# FUNCTIONAL DESIGN

# FIRST TIME SIGN-ON

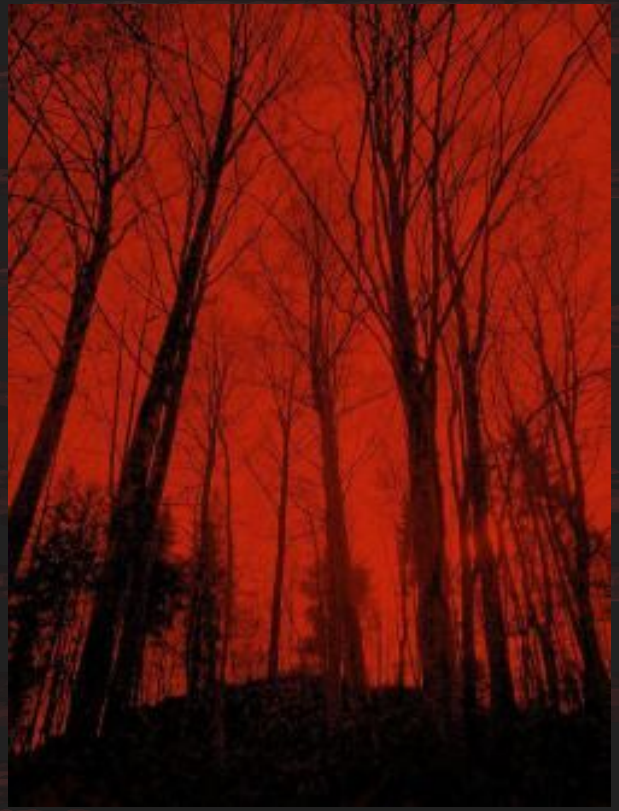


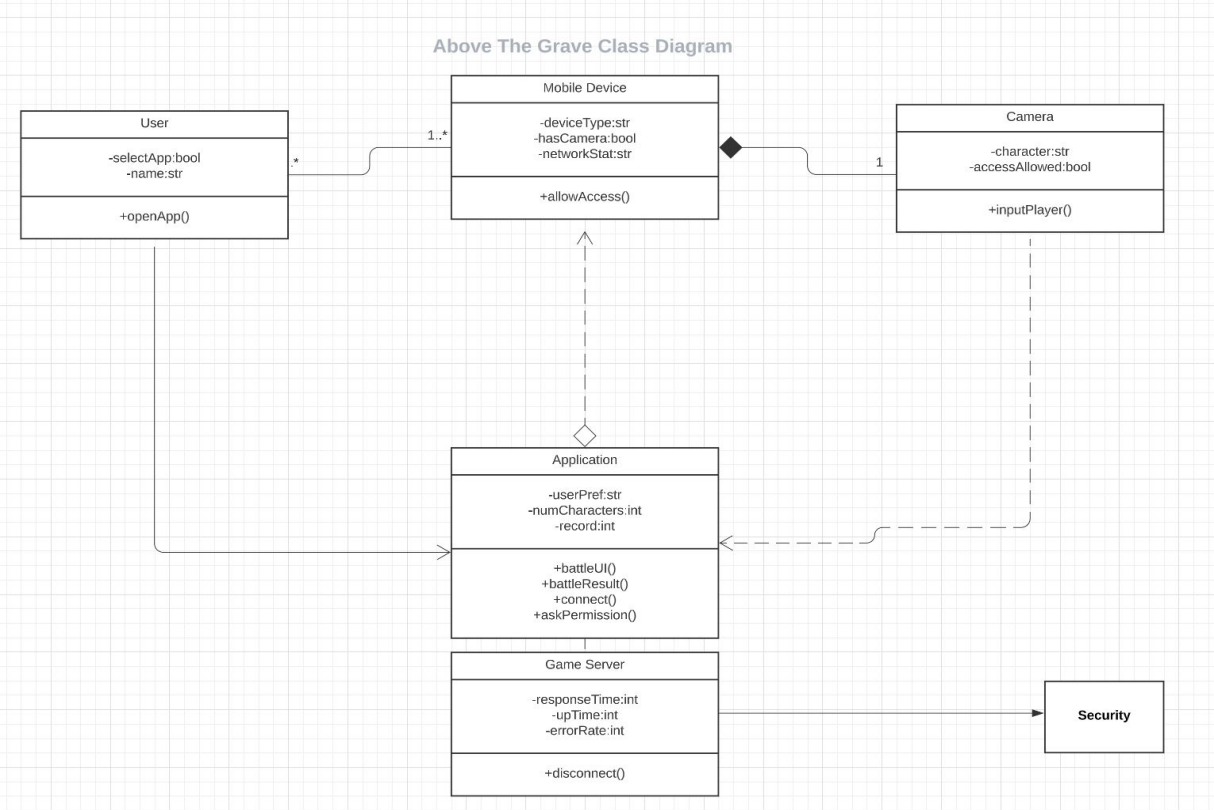
# BATTLING IN ABOVE THE GRAVE



04

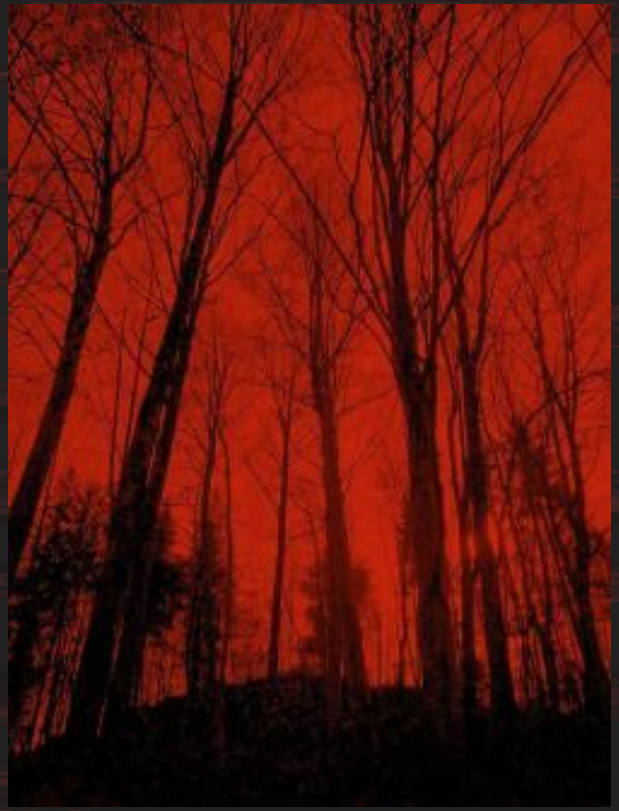
# STRUCTURAL DESIGN



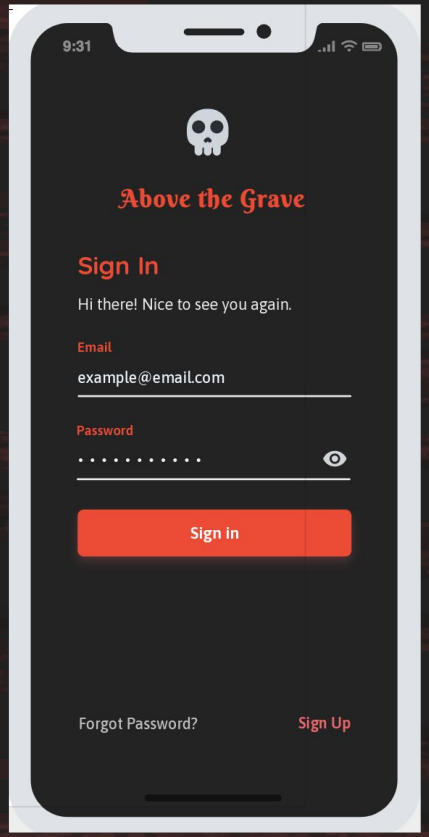

Above The Grave Class Diagram
User
-selectApp:bool
-name:str
+openApp()
.*
1..*
Mobile Device
-deviceType:str
-hasCamera:bool
-networkStat:str
+allowAccess()
1
Camera
-character:str
-accessAllowed:bool
+inputPlayer()
Application
-userPref:str
-numCharacters:int
-record:int
+battleUI()
+battleResult()
+connect()
+askPermission()
Game Server
-responseTime:int
-upTime:int
-errorRate:int
+disconnect()
Security

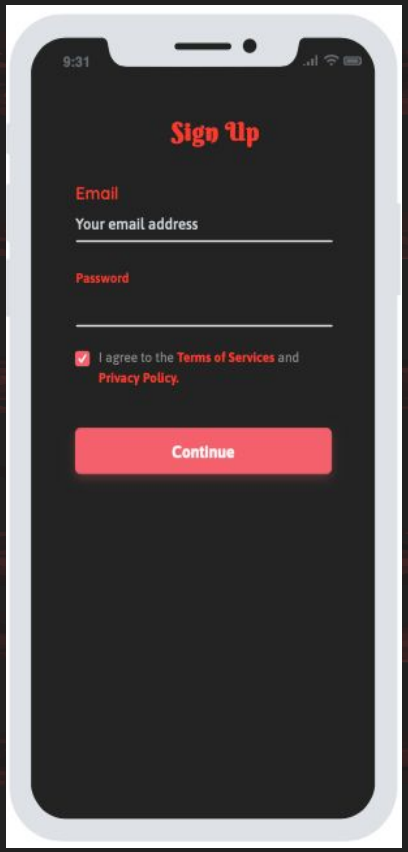
05

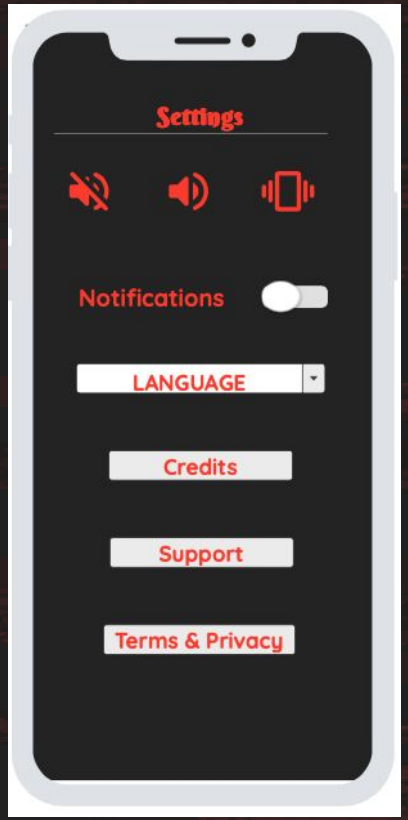
# MOCK-UPS



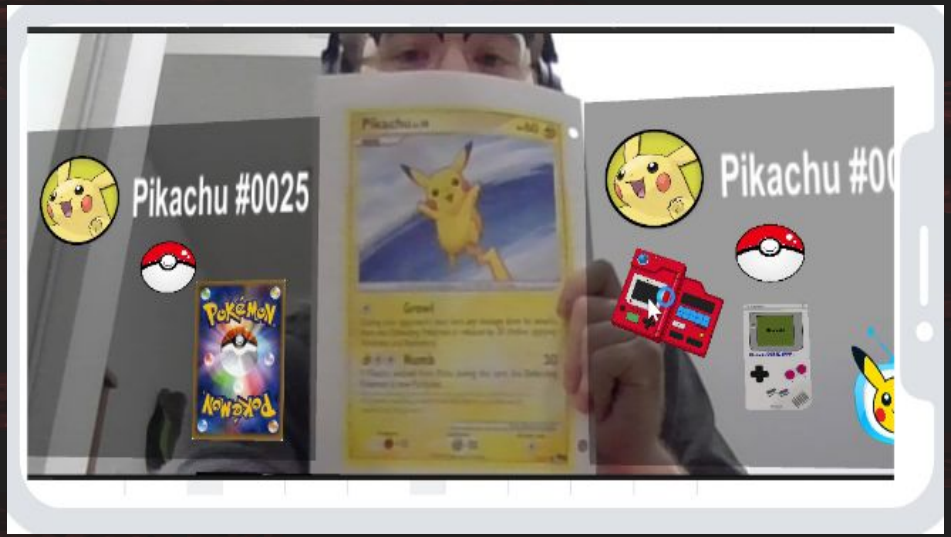

9:32
Stockholm
13°
Sunny
H:21° L:14°
Weather
Clock
Maps
TV
Camera
Mail
Files
NATURE
2019
Photos
Weather
App Store
ATG
Home
Someday
Weval
Music
Photos
Reminders


9:31
Above the Grave
Sign In
Hi there! Nice to see you again.
Email
example@email.com
Password
Sign in
Forgot Password?
Sign Up


9:31
Sign Up
Email
Your email address
Password
I agree to the Terms of Services and Privacy Policy.
Continue


Settings
Notifications
LANGUAGE
Credits
Support
Terms & Privacy


iOS ui
UI 4.2
PANO
PORTRAIT
PHOTO
VIDEO
CINEMATIC


Pikachu #0025
Pikachu #00