**INTRODUCTION:**

Although most board games feature amazing art and innovative layouts, the board is relatively static and unchanging. As a result, it is often difficult for players to fully immerse themselves within the world before them.

We seek to expand upon the traditional board game experience through the use of augmented reality (AR). In our AR version of "The Resistance: Avalon," the players will wear a virtual reality headset (Google Cardboard), open up our application on their Android smartphone, and utilize the smartphone’s back camera to gaze at a printed out version of a QR code. This QR code initially represents the board, and when gazed at through the headset, a 3D representation of the game board appears on top of the QR code.

**OBJECTIVES:**

- Create a more immersive gaming experience for board game fans
- Create a real-time, multi-player experience for mobile app game fans (as a side effect of developing for mobile devices)

**GAME OVERVIEW:**

1. There are 4 players: 3 good and 1 bad.
2. Bad player is RED.
3. Good players are GREEN.
4. Players can only see their colors. They cannot see anyone else’s colors (everyone else is grey).

**EXPANSION IDEAS:** support for more players || different environments || “phantom” players

**REFERENCES:**

This project was completed as part of CS 234/334 Mobile Computing (Winter 2016), taught by Prof. Andrew A Chien, with TA support by Yun Li and Yan Liu.

**TECHNOLOGY:**

We used the game engine Unity to specifically develop a Google Cardboard app for Android devices. We created the game board using pre-made models from the Unity Asset Store. To account for changes in the game state, we wrote C# scripts and attached them to specific game objects (players, quests, etc.).

We used the Vuforia AR Extension for Unity to register our “image target,” the QR code upon which our 3D game board was projected.

We used the Photon Unity Networking library predominantly to achieve multi-player functionality and to properly network all the changes in the game state.

**GAMEPLAY (4 players):**

When players connect to the app, they are randomly assigned to be “Good” or “Bad.” The first player to connect is assigned the position of quest leader. The leader is depicted by a blue token underneath the player. This token moves:

1. When there is more than one “Reject” when approving players to go on a quest
2. Or when the quest decision has been made (explanation below).

The leader player chooses which players to go on the quest (2 players for the first quest, and 3 for the next three quests) by gazing at the players and clicking on them. When the players are selected, a blue halo appears around them. All players must either “Approve” or “Reject” the quest members (see the picture above). They do so by clicking the appropriate buttons that appear. If there are three or more “Approves” in total, the game goes to the next stage. Note that if there are 2 or more “Rejects,” the leader token moves to the next player, and the selection process begins again.

If the quest has been approved, then the selected quest members must decide on the quest’s outcome: they can “Succeed” or “Fail” the quest. The good players can only “Succeed” the quests, while the bad player can either “Succeed” (in order to hide his or her identity as the bad player) or “Fail” the quest. If there is even one “Fail” in this tally of quest decisions for the round, then the quest turns red. If there are all “Successes” then the quest turns green. If three out of the four quests are green, the good players win. If two out of the four quests are red, the bad player wins.