Hide&Seek

Goal

Going in the course

The goal of our project was to experiment with something that we had not yet experienced. We discussed the different tools that could be used and also realized that we wanted to create something interactive while also gaining knowledge that would help us in our game design careers.

For the project

We wanted to create a mixed reality application where a group can track each other's locations using gps, the main goal was to enhance the typical game of hide and seek. However, to take into account that there are many variations on the game, we wanted to make a tool rather than a game, such as to give players the freedom to make and choose their own rules.

Technology

We chose to make a phone based AR game, because they are almost always on our bodies. This makes it a very attractive solution for an easily accessible method to let people use our AR game tool with low setup requirements.

For the location tracking we initially looked into using google's ARcore package for unity, however after more research we found that the camera of the phone is required to track locations using motion vectors. And after some discussion we decided that always having the camera on coupled with slow movement for the motion vectors to be generated did not fit our imagined game play.

After moving away from ARcore we decided to use GPS to facilitate a larger scale playing area where the AR aspect would become more prominent as well.

For sharing our GPS location data we used a server which runs on a computer, the reason for this decision was to keep the implementation and development of networking simple.

Design

The game consists of *hiders* and *seekers* and resembles the game *Hide&Seek* where one person/team tries to find and catch the other person/team. The player must choose either of the teams when starting the game.

We started with a game where we could track players within a hide and seek game using a radar, where you could play in a building sized area. The initial concepts contained ideas for having a ghost like digital entity follow you, or having cops and robbers where you had to scan certain objects using the camera on your phone as a robber to steal and the cops had to prevent that.

But the move to a larger scale using GPS introduced difficulties which made us opt for an open ended ruleset to allow more flexibility to the players to come up with their own rules and play area size, using the AR app as a tool for their own game rather than a game in itself.

Seeker
The Seeker has a radar that shows where the hiders are, this radar only shows the general position of a hider and thus is used as a guide. The range of the radar is set to 50 meters for the prototype, but can also be configured quite easily.

The goal of giving the radar is to allow for the seekers to be able to look for hiders more efficiently when playing in larger areas.

Hider
To add an AR element to the hider we decided to implement game elements for them. The first one is a number on their screen, showing the distance of the closest seeker, not in which direction, only the distance. This creates a more tactical and fair play where the hiders don't feel like they are being hunted without any way to respond. It also allows for tactical gameplay where hiders can try and move around to get a feel for where the seekers are while trying to avoid being caught.

The gameplay element is the concept of gadgets that can be used to get, share or obstruct geolocation information. An example of this would be a jammer that you can activate where after activation no location data can be tracked around the location of jamming activation for a time period. Other ideas include a temporary radar showing seeker locations with a long cooldown, or being able to share and see the locations of other hiders.

These gadgets and the radar are the core of our AR app, to be a toolkit that can be used to facilitate open ended gameplay in large play areas.

Iterations & Problems
Different iterations have been made. We started with setting up a network, as this is the most important part of our project. GPS location is as important, and we decided

to get that working at the same time. By the time the server was all set up, a lot of client-side functionalities were already implemented. Unfortunately there were a lot of merge conflicts, which were difficult to fix, because of Unity. When everything was finally set up, the server didn't work anymore. Some files went missing during merging, some hardware problems like port-forwarding went wrong, etc. When everything finally worked, we were able to implement the jamming button for the hiders quite quickly. This also had some issues, but they were quickly solved during some debugging. Finally we added the finishing touches, like the jamming animation, and the compass rotation.

Insights

Positive

We have created a good base that now can be iterated upon. We have lots of ideas on how to iterate the game into a game where you play as thieves and police instead. The thieves could have a mission to take pictures of different art, buildings, or even people. While the policeman would try to catch, stop the thieves or even guard the objects. Other interactions - puzzles to fix the radar and marco-polo type of sounds - can also be easily implemented, and would make this game very fun.

We have found that unity makes development using smartphone features very accessible.

Negative

The negative part was that we were too dependent on the networking and waited too long to try other game elements before it was done. We could have created a system where we could test jammers and other mechanics and then just implement them as soon as the networking was done. We didn't do this however, because it would take as much time as setting up a real network.

Another insight is that our decision to use phone sensors for the radar ended up being a major bottleneck during development, each time we had to test code or fix a bug we had to rebuild the app, move the apk onto our phones, install the app and then test if our code or fix worked. This ended up taking a lot of time that normally would have been 1 second in the unity editor pressing on the play button.

Interesting

In our internal playtest, we felt like our app really enhances the hide and seek experience. For the seeker, it becomes less "running around until you see someone" and more tactical. For the hider, it adds a layer of tension. Even when the seeker is not close, you always feel like they know exactly where you are.

The team consisted of four members and their role in the team was as follows,

- Adam Berghäll
    - Design and documentation.
- Lucas Disseldorp
    - Developing the networking system.
- Xiaoyi Hu
    - Developing the radar.
- Nout Heesink
    - Developing the GPS system and team leader.

And a reminder that the whole team partook in brainstorming to come up with the initial idea of the game. Also generating and helping with design and iteration of the game throughout the course.