

Lappeenrannan teknillinen yliopisto  
School of Business and Management  
Computer Science

Seminar for course Codecamp

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**Waveball - A Game Jam Project**

## INTRODUCTION

This report discusses about the experience of working in a team on a game project during one weekend long hackathon called Finnish Game Jam (FGJ). Finnish Game Jam is a yearly event and part of Global Game Jam (GGJ). During the Game Jam teams are formed and team comes up with an idea for a game based on the yearly theme of the Game Jam. By the end of the weekend team is supposed to have some working prototype of the game ready.

GGJ 2017's theme was "Waves". After brainstorming the team decided on making a 3D network multiplayer sports game called Waveball where players try to get a ball floating in water to the opponent's goal by using the waves made by throwing rocks in the water.

In the end team succeeded in getting the multiplayer of the game to work so that game could be played over the internet. However lot of time was spent on developing the networking so the polishing of the game was unfinished. Despite the unfinished state of the prototype the team considered the Game Jam a success since a lot was learned from Unity's networking capabilities and graphical goals were achieved.

This report is written for LUT Course *Codecamp* by Anton Simola and Joonas Hasu. Other project members participated in the implementation of the game during the Game Jam but did not participate in report or seminar preparation.

The rest of this paper discusses the process of making the game in a weekend in more detail. In chapter 2, the team forming and coming up the idea for the game is discussed. In chapter 3, the implementation of the game is explained in short. Chapter 4 discusses about the results of the project. Chapter 5 discusses about the learnings, future work and speculations.

## **PROJECT INCEPTION**

### **1.1 Team forming**

Originally Anton and Joonas arrived to the Game Jam as group of two and Sami, Alan, Tomi, Ilmari and Pessi arrived as another group. Since Joonas, Sami, Pessi and Tomi were acquaintances we decided to join our forces since there was a mismatch of programmers and artists in both of the groups. This was first Game Jam for Anton and Joonas, others had participated before.

### **1.2 Brainstorming**

After the theme reveal of the Game Jam and team forming we went ahead to have a brainstorming session about the game idea. A lot of ideas were discussed. We discussed about the different meanings of “Waves”, for example including Aalto university was discussed. Right from the start we mostly focused on multiplayer game ideas since we wanted the game to be enjoyed by group of friends. Unity was also chosen as the game engine early in the discussions since most of the team had already some experience with it or at least wanted to have more experience from it. Sami also wanted to learn more about the network multiplayer capabilities of Unity game engine and others agreed on trying it out. The team had little to none experience from making network multiplayer with Unity so it was excellent opportunity for everybody to learn something new. We also had a lot of 2D and 3D artist skills in the team so we decided to try to come up with 3D game so that everybody would have some role to fill.

One of the first ideas was explored very thoroughly. The idea was to have asymmetrical 2-player game where one player builds up a structure such as a sand castle from different 3D objects and the other player would then try to cause as much harm as possible to this structure using ocean waves. Even though team enjoyed the idea in the end we decided to abandon the idea because the scope was thought to be too big and team was afraid of the

technical challenges considering 3D waves, physics and collision. Other ideas included: Wave surfing and dodging objects floating in the water, dodging objects in a city being destroyed by a tsunami wave, a horror game where player is escaping a monster and trying to get to a room where there's a signal of radio waves which will destroy the monster, trying not to spill your beer while being in wavy water in a swim ring as well as some very bizarre ones such as trying to keep a person strapped on a hospital bed while the person is having horrible hangover trembles.

In the end we abandoned the idea of sand castle destruction game to what was thought to be a simpler multiplayer game. It would be a 2-player network multiplayer game in which both the players throw rocks into the swimming pool in order to create waves. The goal would be to carry the game ball using the waves to opposite goal and score as many goals as possible. This idea was chosen among the numerous candidates since we thought the idea and the scope was clear and simple enough to be implemented in a weekend, it had the networking component for all of us to learn and it would need both 2D and 3D assets so everybody would have something to do.

### **1.3 Division of work**

After settling in with idea of the game and the technologies we divided the work based on experience and interests of the members.

Alan would make the 3D assets for the game such as the game ball, rocks, goal buoys and deck chairs. Alan has many years of experience in 3D modeling and does it professionally.

Tomi would do the shaders for 3D assets as well as other post processing work. Tomi also has many years of experience in this area and does this professionally also.

Pessi would do 2D assets such as game menu and HUD elements in main screen since he has many years of experience in this area and does this also professionally.

Joona would be the in programmer role doing physics, object interactions in the game. In the end Joona also worked a lot with the networking code. Joona has some experience with Unity and programming.

Anton would be in programmer role doing game rules, game state and UI interaction. Anton had only tutorial experience with Unity but some programming experience from other kinds of projects and game engines.

Sami would also do programming and he wanted especially learn about Unity multiplayer technology. He would do investigation and start implementing the network code. Sami also specified a lot of the requirements for the game. Sami has participated many game jams but does not do games professionally. He works as a programmer on other types of projects.

Ilmari would be project manager and would do sound assets as well as help with programming, especially make the sounds work. Ilmari has participated game jams before and has experience from programming.

#### **1.4 Tools, technologies methods used**

We decided to use Unity game engine since most of us had experience from it and it would suit the needs of making 3D game with ease as well as providing networking capabilities. Blender, Gimp and Photoshop were used for 3D and 2D modeling because of experience with them. Shaders were made with ShaderForge (Unity plugin) because of experience with it. For programming Visual Studio and MonoDevelop were used. We decided to try out Unity Collaborate for collaborating in the project for sharing code and scene changes. For audio editing Audacity was used.

We didn't use any systematic software development methodology but mainly Sami was assigning tasks when previous task was completed.

## **IMPLEMENTATION**

This chapter discusses the main milestones achieved during the weekend in the implementation phase.

After the brainstorm, initial design and division of work we started the implementation around 20:00 Friday evening. Immediately artists started making the pool, water and ball and got the game objects ready in couple hours. First task for programmers was to get the ball floating and start implementing main menu and game rules. After Friday we had floating ball with initial version of wave giving force to ball. We also had the pool, water and ball assets done.

On the second day we continued with game logic, rules and object interaction with pool walls. Saturday afternoon we had working local version of the game but with no network component in it. Also 2D assets for menu, scores and other HUD elements were ready Saturday evening. On Saturday evening all programmers sat down together to figure out the networking component of the game. This took the whole evening from all programmers since it was mostly new techniques for all of us. Quite a lot of the code written for local gameplay needed refactoring to make the networking possible. In the end we got the networking component working Sunday morning. After that we put 2D assets and final 3D assets in the game world as well as the sounds.

## RESULTS

Our main focus in the game was to learn about Unity networking component as well as the visual representation of the game since we had some many artists in the team.

We feel we achieved the goal of learning from networking but we would have liked to try out more of Unity's provided features such as the matchmaking system but we ran out of time. We feel also that the visual goal for the game was reached. However a lot of polishing work could not be finished since so much time was used to get the networking component working. Also the gameplay mechanics were left to their initial versions and could not be optimized due to lack of time. The most difficult part was to get the networking done but after the initial setup, Unity is able to do lot of the work such as syncing game state automatically.

We tested the game on two developers' computers to see the networking in action and also one developer could test networking by making a build and running one instance in Unity editor and one built version to test connection.

We followed the initial idea quite well. We made the wave interactions to be a bit simpler than the initial idea and we would've liked to have more networking features, but other than that the original idea was achieved.

If we would redo the project from scratch now, we would plan the networking component to be in the game right from the start. Now we had the local game without networking component ready quite quickly but it took a lot of time to refactor all the components to fit with Unity's networking.

As mentioned earlier we decided to try out Unity's collaborate functionality which is in Beta state at the time of writing. Most of the time it worked just fine but there were some issues when editing the same scene as well as sometimes collaborating would lose the

linking between a game object and a script for example. It would also prove helpful when we needed to roll back the project status when Disco effects in the pool went completely overboard at the end of the Game Jam.

If we were to continue with the project, we would next improve the networking to include matchmaking as well as fine tuning the game state syncing since now some events are only happening locally.

## **FEEDBACK**

Our experience was extremely positive about the organization of the event. There was space for everyone, no technical issues and positive and cheering atmosphere and free stuff! We were first time comers to Game Jam and we were unsure about the group forming beforehand but it worked out well in the end. We would definitely recommend this event to friends.