

# Conclusion Chapter

## 1. Summary

Our game **IceWave** is a physically based surfing simulation with combined rendering techniques for raytracing the water and rasterization. It is set on the Eisbach wave, a known in-city river surfing place, therefore fulfilling the thematic vision of the course being “Munich”.

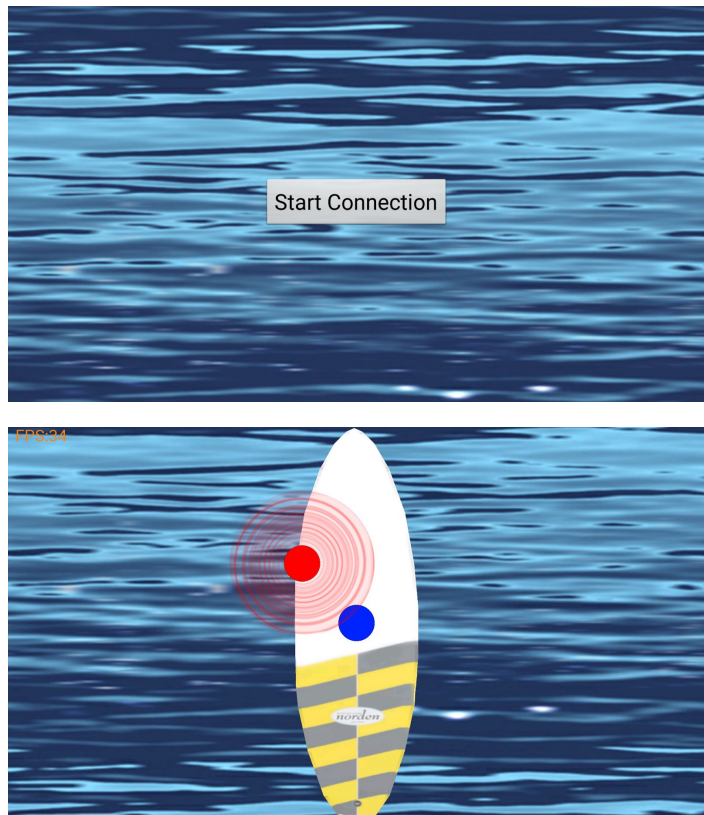
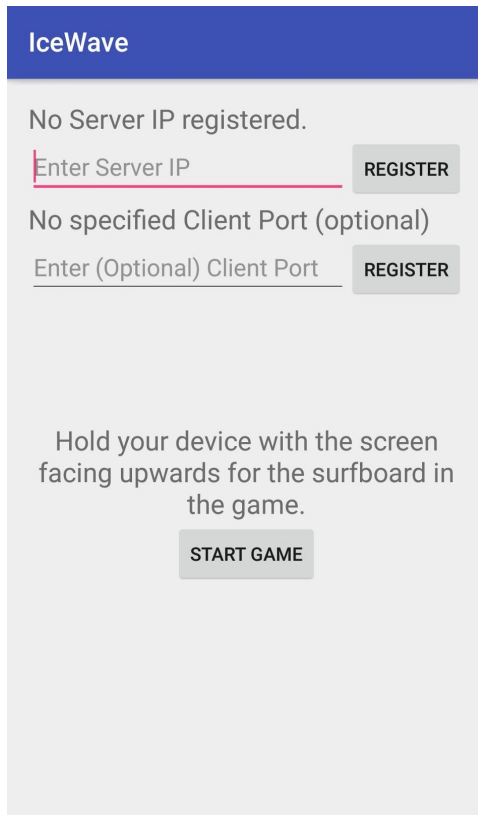


We focused on having an accurate behaviour of the water physics interacting with the surfer, while also creating a visually appealing view of the scene. This is done by adding water particles to the physically based fluid rendering.

Since the last release, we worked on a refined input mechanic to be still challenging for the player but not frustrating on the long run, so that the surfer can always be controlled with a certain effort. This is realized by our physics control support, which helps the player to keep the intended position. This is work of some physical depending value tweakings, which is why we don't support different difficulties as of now.

We also listened to the feedback of our playtesters and changed responsiveness of the app as an input device. Additionally, we changed the layout of the running application in an easier to hold landscape orientation of the smartphone. That way players can more easily change rotation of the smartphone in contrast to the portrait

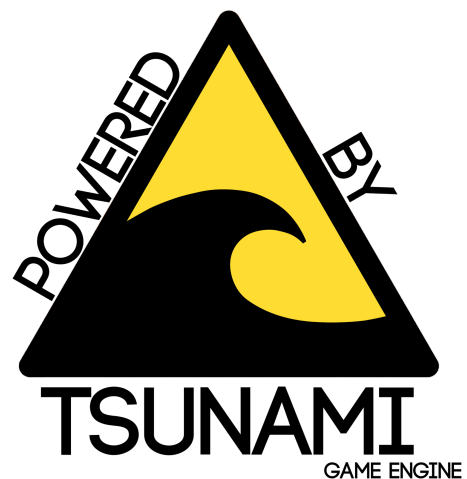
mode with only one hand. Reacting to surfer changes is faster with two hands holding the device.



## 2. Experience during the Class

At the beginning we thought about game ideas which are unique but at the same time fulfill the theme given by the course. With a physical based simulation we found a challenging idea, for which we needed and wanted to create our own custom engine to have full control over performance, memory management and rendering passes. The major aspects where the graphics, the physics and the input, which we all needed to integrate into our **Tsunami Game Engine**. When we achieved a stable version, we

could start integrating our gameplay elements, namely the surfer, the surroundings, textures, sounds and other assets, the controls and the gamellogic itself. But we couldn't completely follow our intended development schedule. In our brainstorming session at the beginning, we thought about different input devices which support a gyroscope. In a later presentation in the course we were asked about a potential



smartphone integration control. This was a great idea, which we haven't thought of, but a very lot of people have access to a smartphone or have one at least on their own. So we changed our schedule to incorporate a smartphone. We already had done some work on the input, which we couldn't really use now as we needed a connection, in the best case wireless, with the game. So we included a network layer into our engine, with which we can connect to with the smartphone. Also a smartphone application was needed, which added a lot of work. Otherwise the development schedule was mostly followed as we intended it, but we needed to shift some elements into a higher target, which we only implement if we have the time and finished the intended target.

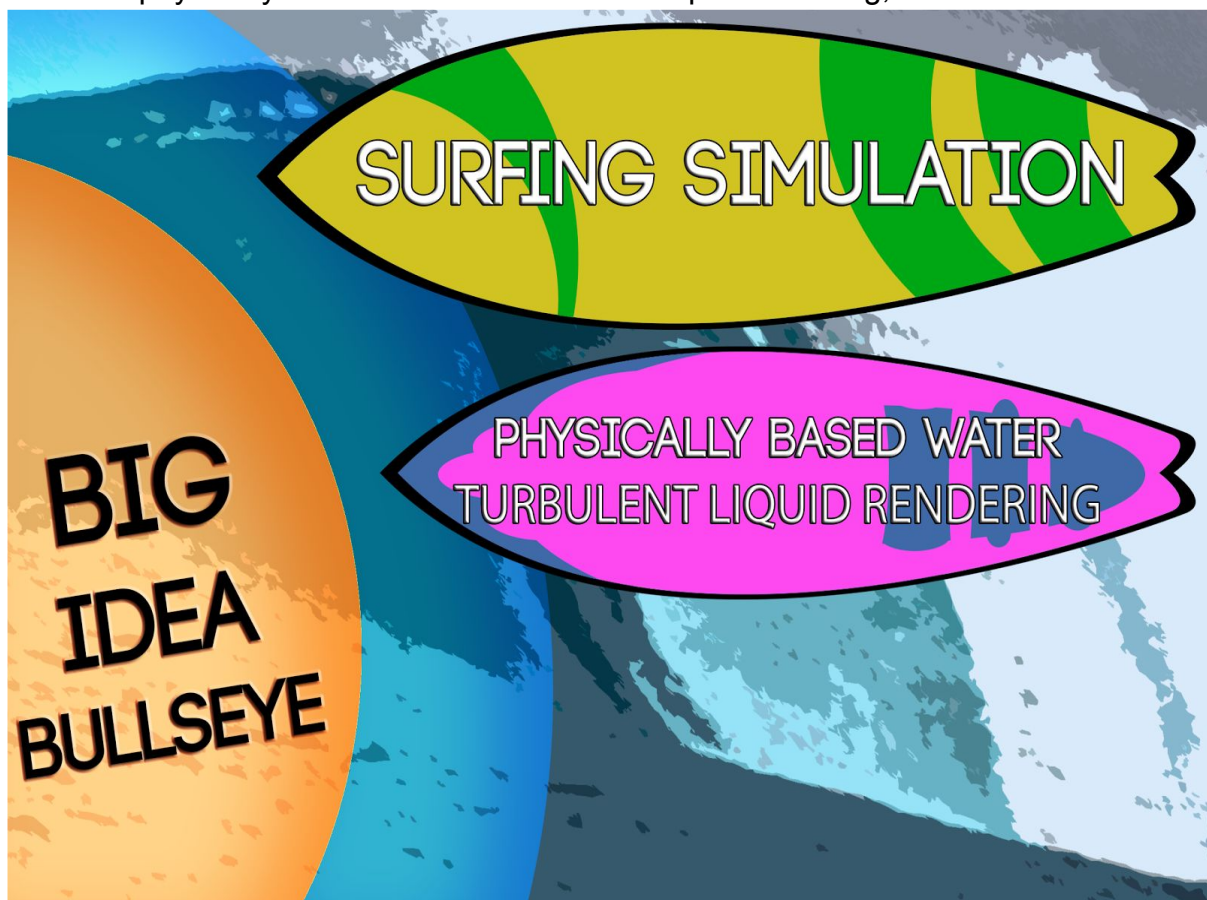
The prototype milestone of the project structure hindered our progress on the game and the engine a bit, as we wanted to create an engine with a simulation underlying the gameplay. The prototype forced us to think of a game without a simulational aspect, which we couldn't know. Our gameplay would have depended on the physics simulation of the fluid system and then resulted in a game balanced around that. With an additional thought process into the prototype we had to think of something final, which turned our later work in a more restricted direction. Later on we noticed that, as many additional factors cannot be integrated in a simple prototype and would have also changed the feeling of the game, the controls being only one example.

### **3. Impression of the Course**

The course was interesting as we could work on our own idea and finalize it into a game. We wanted to create a custom engine, which is no easy task, but it is definitely an experience. You notice all the small things, which don't look like much, but turn out to be a lot of work and especially need a lot of thoughts going into creating a solid architecture. Only if we achieve this, we can extend the engine to support several other functionalities, and finally a game. As we were able to build an engine and a small game on top of it, we achieved our target and are proud of our product. But we could have needed additional time, as holidays and absences due to illness took away some of our working time.

1. The biggest technical difficulty during the project was definitely the physics, as it depended on several factors which makes it a difficult task to stabilize, especially with the input control interaction.
2. Working with the theme "*Munich*" seemed strange at the beginning, but we think we found a good topic when we sat together and brainstormed about ideas.
3. The theme did not really enhance our game idea, but total freedom wouldn't have been the way to go either. A theme targeted around genres or events might be a possible option instead of a relatively small location.

4. In our next game project we would try to focus on even less technical challenges, as creating an own engine is already a lot of work which needs to be done on top of developing a game. Another possibility would have been to use an existing engine, which in contrast would limit us in functionality and performance.
5. The greatest success of our project was the engine itself, which works like a black box for every functionality we want to add to the engine. We don't need to care about implementational decisions, as we can simply use different parts, we know that it is handled by the underlying system. It felt great, using the different parts of the engine and it simply worked together.
6. We are quite happy with our final result. With a little more time and freedom without additional milestones, we are confident to create the surfing simulation, everyone wants to play, if they are into a challenging inner-city-surfing. Like *Skate* for the skateboarding community.
7. In this respect we consider the project, to create a custom engine fulfilling our big idea bullseye of having a surfing simulation with the technical challenges of physically based water and turbulent liquid rendering, a success.



8. We met all the milestones and quite always our project plan, except for the change of priority to integrate the smartphone control, which needed shifting of other tasks. But we followed our updated plan thoroughly.

9. Suggestions for the course organizations could be to have a really clear communication about which deliveries to have on every lecture or presentation date. Also the allowed time frame for the presentations could be stated clearer. It's student/user friendlier to repeat information on every lecture date at the end, not only once at the very beginning. Information gets lost that way over the time of the course.

#### **4. Final Digital Video**

<https://drive.google.com/open?id=0B8zEIVwP365-SkFIZXE3MVdWb1E>