

Group 4: T. Atkins, D. Dahl, T. Ho, K. Chen Kahnert, M. Swartz

Dr. David Johnson

EECS 581

Sunday, September 11, 2022

### **Sprint 1 Requirements Artifacts**

#### **Requirement ID: 1 - Discuss Strengths, Decide on Project Theme**

- Over the course of group meetings and Discord conversations, the group members presented their strengths/areas of interest:
  - Tyler Atkins: hardware, soldering, equipment availability.
  - David Dahl: machine shop, 3D printing/manufacturing, data manipulation.
  - Tram-Anh Ho: graphic/motion design, Node.js.
  - Konrad Chen Kahnert: music production, 2D development in Unity.
  - Maggie Swartz: previous BS in Chemical Engineering, generally adaptable (w/ languages, software, etc.).
- Based on the strength of his presentation and the scalability of the project components, the group decided to move forward with David's project idea - Psychoacoustics. David's PowerPoint Slides are updated for reference as needed (titled PSYCHOacoustics\_EECS581\_Group\_4.pdf).
- The project will entail the development of a virtual reality rhythm game with procedurally generated graphics and beat maps.

#### **Requirement ID: 2 - Initial Project Theme Research**

- Each group member conducted their own research into possible ideas for the project theme, an overall summary of that research is listed below:
  - Tyler Atkins: The pitch project was what initially got me interested in VR, and afterwards I wanted to develop some kind of experience in VR, perhaps story driven and inspired by the likes of games like "The Beginner's Guide".
  - David Dahl: development of a VR rhythm game, similar to *Beat Saber* (the group chose this project idea for further development).
  - Tram-Anh Ho: I looked into rhythm games that incorporated stories into the gameplay, and for the most part, I found games that delved into the story between the levels (e.g. *Elite Beat Agents*, *Deemo*, idol games like *Love Live!* and *Enstars*), but there was a game that incorporated story into the actual gameplay (*Deltarune*). Either way, our game doesn't look like it's panning out to having a story, but that's alright.

- Konrad Chen Kahnert: Wanted to make something related to music, such as an audio visualizer or synthesizer.
- Maggie Swartz: initially interested in VR synesthesia project. Also looked into VR climate change simulation or VR empathy experience for non-disabled users.

### **Requirement ID: 3 - Hardware Research (Desktop)**

- The best VR headset for our purposes would probably be the Oculus Quest 2 since it has pretty good tracking and display, is relatively cheap, and is compatible with Unity. We should try to get a headset that the University already has before we try and buy our own. We will need to inquire about this with Professor Johnson.

### **Requirement ID: 4 - Software Research (Desktop)**

- We will need to choose a game engine for the development of this project. Unity is a good choice because of its ease of use and VR support, and because it is free. However, Unity also has optimization and performance issues. Another limitation of Unity is that it only supports Oculus headsets or headsets that support OpenXR.
- For asset creation, we will probably use Blender since it is quality and free. We could also use free Unity assets since none of us have much 3D modeling experience.
- Konrad has a lot of experience in Unity so that might make the learning curve for everyone easier as well.
- Other potential game engines include Unreal or Godot. Godot is similar to Unity in that it is easy to use, but since it is less popular it has less documentation and tutorials available online.
- Right now, we are likely going to go with Unity for our engine.

### **Requirement ID: 30 - Update Story Points/Requirements Stack**

- The team has decided to move forward with the development of a virtual reality rhythm game, similar to Beat Saber. In order to complete this project over the course of two semesters, the project can be broken up into two overall phases: (1) development of a working desktop model game, and (2) development of a VR experience game from the desktop version.
- The Story Points Estimate Spreadsheet and Requirement Stack spreadsheet were updated to reflect this two-phase development model. Therefore, story points/requirements for hardware research, software research, back end development, UI/UX development, and user testing were divided up to better reflect this approach.
- Additional story points/requirements were created to represent the desktop to VR transition and research into the inspiration game, Beat Saber.

- The addition of these story points/requirements brings the total to 30 for each, above the all team's average of 21.6
- The updated Story Points Estimate Spreadsheet (Updated\_Agile\_Reference\_Stories.pdf) and Requirements Stack (Updatd\_Requirements\_Stack.pdf) spreadsheet can be found uploaded in Canvas.