

HoloLens Prospectus

Team Description

Summary of Individual Strengths

Chase Mulder:

- Limited Unity experience in a ball roller game.
- Some experience with blender making 3d models.
- Major Computer Science
- Minors in Computer Engineering and Mathematics
- Good with languages C/C++, Java, Python
- Ok with Linux, SQL, HTML

Mohammad Selah: Mohammad is a Computer science student at GVSU, with a couple of freelance programming experience under his belt. But now that he would like to finish his degree and find new opportunities that will challenge his technical skills. Mohammad is proficient with C, python, linux, and some javascript experience. Ultimately I want to learn new things that will challenge me.

Lucas Seeterlin: Lucas is a Computer Science student expected to graduate this December. He has experience through two internships at Rocket Mortgage as a software engineer and Open Systems Technologies as a software consultant. Lucas has experience working with both Unity and the Microsoft HoloLens, as well as knowledge of human anatomy from a previous course. He has various experiences working with groups to complete projects.

Liam Mazure: Liam is a Computer Science student hoping to pursue opportunities in the software development industry upon graduation. He has developed numerous skills throughout his time at GVSU including an excellent understanding of Java, Python, and C/C++. He has also worked on a variety of projects to gain a comprehension of HTML, CSS, and SQL. Outside of his technical skills Liam has developed a strong base in his

soft skills from his multiple years as an Resident Assistant(RA) on campus. Which provides him the ability to organize and problem solve with a team over a shared goal.

Anticipated Areas of Growth

Chase Mulder: Through the course of this project I hope to gain more knowledge in the areas of programming in Unity C sharp scripts. Also, I hope to utilize anatomy libraries in Unity and link them to the Hololens demo. I'm very excited to be working on cutting edge technology like virtual reality because it is the future. I expect this project to be challenging and I hope it refines my abilities as a new professional software developer.

Mohammad Selah: Ultimately Mohammad has very little experience with Unity, C#, hololense and augmented reality. So, learning about the libraries and scripting in Unity to add components for this project. I am excited to learn and see what failures I will encounter.

Lucas Seeterlin: I anticipate that I will gain more knowledge working with a group on a Unity project, similar to the experiences I have had in the past. I am also expecting to increase my understanding of the human body throughout this project. Working with Unity is not something new to me, however using it with the Hololens will present an interesting challenge that I am excited to start on.

Liam Mazure: Liam anticipates to be challenged by his lack of experience with both the Unity engine as well as C#. This means that Liam will focus on where his weaknesses lie in order to help his team succeed in this project. Liam also has few experiences working in a professional development environment. This absence of exposure will mean that Liam must take the initiative to improve in this area more than his teammates who have had more experience.

Project Description

Background Information

The Microsoft HoloLens are a pair of mixed reality smart glasses that allows users to interact with a variety of applications/programs in an augmented environment. Microsoft flashed the HoloLens's ability to accelerate and mitigate any issues that may arise in a manufacturing/engineering setting. Along with their ability to enhance the delivery of doctor to patient treatment and improve the education of students by providing teachers the ability to instruct remotely. The area of focus for our capstone project is to overlay 3D anatomical models on the user's person to provide patients and students the ability to interact and learn from the models they see placed in their mixed reality environment.

Description of Intended Features/Backlog

1. 3D modeling of anatomically correct body structures
2. Provide an interactive user interface to shift between different structures.
3. Place descriptive notes alongside each structure for learning purposes.
4. Doctors ability to use real patient CT scans on dynamic models.
5. Allow for uninterrupted flow of models over ideal positions on the user.

Anticipated Platform/Tooling

- Blender/Unity assets for 3D models.
- C# for placing and interacting with models.
- C# for creating a seamless user interface to switch between structures.

Ethical Considerations

1.01. Accept full responsibility for their own work.

2.05. Keep private any confidential information gained in their professional work, where such confidentiality is consistent with the public interest and consistent with the law.

3.02. Ensure proper and achievable goals and objectives for any project on which they work or propose.

3.07. Strive to fully understand the specifications for software on which they work.

3.08. Ensure that specifications for software on which they work have been well documented, satisfy the users' requirements and have the appropriate approvals.

3.10. Ensure adequate testing, debugging, and review of software and related documents on which they work.

5.01. Ensure good management for any project on which they work, including effective procedures for promotion of quality and reduction of risk.

6.03. Extend software engineering knowledge by appropriate participation in professional organizations, meetings and publications.

7.03. Credit fully the work of others and refrain from taking undue credit.

Video notes

Models for specific patients

The models fit to their body

App marks anatomical reference points - Ac joint - embolicis - azaphoi - asis - inferior ribs laterally - this is whole thorax - Outlines placement of internal organs

Male vs female

Overlay system

Fatty - skin - muscle - internal organs

Snapshot feature to show patient - screenshot

Not a page in a book that doesn't fit the person

We are seeing education demo - vs clinical demo which is for use in hospitals

Ct - MRI - Xray - bone scan - whatever image overlay of patient

Patient pinpoint exact spot of pain

(Not library picture of bones, but CT scan picture overlay)

DEMO

Adjust body shape with pulling on body

Point to spot on body and have description

Overlays - skin - muscle - fat - skeleton - organs

Fat volume

Person walks away and the overlay stays

Xyphoid?**most distal edge of the sternum or the breastbone.** The sternum contains 3 major portions: the manubrium, the body, and the xiphoid process.

Actual CT Demo - Initial scan render file of patient

Click and set points on CT image to drag and drop image

Drag hollow box over image to see skeleton view inside

High low mid?

Place point by pinching and holding the location

Questions

Did we see the clinical demo of the Ct scan

Vs the educational demo which was the person walks away and theres the overlay of skin - muscle - fat - skeleton - organs

Do you want us to add more organs to the educational demo

More descriptions for educational purposes

Search bar and list on side to quick goto organs or bones

Quick screen shot button that saves to a patient photo folder

Blood system overlay

animations of digesting or heart beating for educational reference

Quick easy switching back and forth between overlays

What is ds store files?

(Ideas that will help doctors diagnose and patients understand location)

Doctor wants to see the CT image

Patient wants to see where the fracture is

How do we map exact location of organs onto body