

Meeting Minutes

Teams Assigned – 75 minutes – 9/10

1. Weekly Action Items
 - a. Fill out Student-Sponsor Agreement Form
 - b. Sign when Complete.
 - c. Create Github and Discord chat
2. Summary of Progress
 - a. Discussed the Student-Sponsor Agreement form, and filled most of it out,
 - b. While figuring out times to meet with our lead instructor, Bruce,
 - c. Figured out where to have team meetings, after class on Monday.
 - d. We also setup a discord and a Github to communicate throughout our findings.
3. Meeting Review: Helpful/Not
 - a. Helpful
4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien
 - c. Bruce Bolden

Team meeting – 10 minutes – 9/16

1. Weekly Action Items
 - a. Sign Team Contract
 - b. Figure out when and where to communicate with Sponsor.
2. Summary of Progress
 - a. Both signed contract, and Cameron will email Terry.
3. Meeting Review: Helpful/Not
 - a. Helpful
4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien

First Client Interview – 35 minutes – 9/26

1. Weekly Action Items
 - a. Discuss what project requirements are and fill out PRD.
2. Summary of Progress
 - a. The first step is to examine different AR apps that already exist and to figure out the pros and cons of them.
 - b. The one that Terry Soule used as an example is “Blippar”. We also discussed what the final project should look like when it is done. The final project should consist of around 12 different objects around the CS department that have an AR effect on them, using the software of our choice.
 - c. The AR effect themselves are up to us, but we need about 12 different objects. The AR effects should be informative and be useful for people to look at. To see the exact requirements, refer to the PRD.

3. Meeting Review: Helpful/NOT
 - a. Helpful
4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien
 - c. Terry Soule

Team Meeting – 10 minutes – 10/14

1. Weekly Action Items
 - a. Create Portfolio for Snapshot Day
 - b. Create Poster for Snapshot Day
2. Summary of Progress
 - a. We split the two up, with Jubal arranging the portfolio, while Cameron arranges the Poster.
3. Meeting Review: Helpful/Not
 - a. Helpful
4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien

Team Meeting – 20 minutes – 10/25

1. Weekly Action Items
 - a. Have at least two AR apps ready for testing next Meeting
2. Summary of Progress
 - a. We have been reviewing AR applications to decide what options are going to be viable. Our list so far includes: Blippar, SMACAR, ROAR, Snapchat Lens Studio, Sumerian, Zapworks, and Google Lens.
3. Meeting Review: Helpful/Not
 - a. Helpful
4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien
 - c. Terry Soule

Team Meeting – 30 minutes – 11/8

1. Weekly Action Items
 - a. We discussed ROAR and Zapworks as potential options and will probably go with one of them.
 - b. Terry also wants us to look at Blippar.
2. Summary of Progress

- a. We gave a demonstration of ROAR and Zapworks, and both options seem good. We will look at these two options and Blippar and decide which one to go with.
3. Meeting Review: Helpful/Not
 - a. Very Helpful
4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien
 - c. Terry Soule

Design Review – 1 hour – 11/15

1. Weekly Action Items
 - a. Give our Design Review Presentation
 - b. Discuss the solutions we have proposed, and see what our team lead, along with our sponsor think of them.
2. Summary of Progress
 - a. During our presentation we discussed all of the pros and cons of both Zapworks and ROAR, which are the applications that we are thinking about using.
 - b. We also gave another demonstration of them in action
 - c. And we gave our idea of creating our own AR application on top of using an existing one.
3. Meeting Review: Helpful/Not
 - a. Very Helpful, we have basically narrowed down our project to a final design, so that we know very closely to where we are headed with it.
4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien
 - c. Terry Soule
 - d. Bruce Bolden

Snapshot Preparation/Meeting – 12/4

1. Weekly Action Items
 - a. Prepared for the second Snapshot day coming up
 - b. Looked at Android Studio
2. Summary of Progress
 - a. Decided that Android Studio would be a great environment to create our own AR app in.
 - b. Updated our Snapshot poster to be recent
 - c. Updated our Portfolio to be recent
3. Meeting Review: Helpful/Not
 - a. Helpful, we got ready for Snapshot day #2, and also did good research on Android Studio.
4. Attendance
 - a. Jubal Mitchell

- b. Cameron Dearien

Team Meeting – 30 minutes - 2/6

1. Weekly Action Items
 - a. Have decided to make our own app, because costs of preexisting apps were too expensive.
 - b. We are going to develop the app using Unity and Vuforia.
 - c. Look at Unity/Vuforia tutorial online
2. Summary of Progress
 - a. Confirmed the change over to making our own app and will get started.
 - b. Adam Odell has also officially joined the capstone team.
3. Meeting Review: Helpful/Not
 - a. Helpful, we have officially switched to making our own app, so we can get started on the develop process
4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien
 - c. Adam Odell

Team Meeting – 15 minutes - 2/20

1. Weekly Action Items
 - a. We all went through the tutorial and Cameron has the first draft of the app on GitHub.
 - b. Jubal will start working on getting sound
 - c. Adam will start working getting links into the app
 - d. Cameron will start working on getting the interface put together
2. Summary of Progress
 - a. Cameron has the app on GitHub
 - b. The app is working and recognizing an image and displaying AR effects over it.
3. Meeting Review: Helpful/Not
 - a. Very Helpful, we now have a working app
4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien
 - c. Adam Odell

Team Meeting- 15 minutes - 4/9

1. Weekly Action Items
 - a. Our next step is to get everything merged together, so that it all works
2. Summary of progress
 - a. Cameron, Adam, and I have finished our separate scripts on different portions of the App, including, the interface, sound, and hyperlinks.
3. Meeting Review: Helpful/Not

- a. Helpful, we are making great progress with the app, and will hopefully having everything working together soon.
- 4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien
 - c. Adam Odell

Team Meeting – 30 minutes - 4/16

- 1. Weekly Action Items
 - a. Our next step is to get the app onto the app store.
 - b. We also decided to do a version of AR for some k-12 students.
 - c. Get an AR effect for nameplate, and I in U of I logo.
- 2. Summary of Progress
 - a. We got all our code merged onto GitHub and are moving on to get the AR effects into the app we need.
- 3. Meeting Review: Helpful/Not
 - a. Helpful, we decided what AR targets we are going to do before the Expo. And are doing some for k-12 students
- 4. Attendance
 - a. Cameron Dearien
 - b. Adam Odell

Team Meeting – 15 minutes – 4/23

- 1. Weekly Action Items
 - a. Cameron will be working on getting the app into ship shape ability for the Expo
 - b. Jubal and Adam will be working to get the Poster ready for Expo.
- 2. Summary of Progress
 - a. Our app is pretty much ready, except for some slight tweaks to the U of I logo.
- 3. Meeting Review: Helpful/Not
 - a. Helpful, we assigned tasks to who was going to do the Poster and are getting ready for the Expo.
- 4. Attendance
 - a. Jubal Mitchell
 - b. Cameron Dearien
 - c. Adam Odell

Project Learning

Update as of 10/14/2019

1. What off-the-shelf technologies can we use to solve the problem?
 - A. These are some of the existing AR apps we may use to solve our project, however we are still in the testing phase of which to use.
 - a. Blippar
 - b. SMACAR
 - c. ROAR
 - d. Snapchat Lens Studio
 - e. Sumerian
 - f. Google Lens
 - g. Zapworks
2. Why did you think the design would work?
 - A. Our design is to use an existing software, to create 12 different AR effects on items/places around the CS department.
 - a. We believe our design should work, as the existing software provides a platform that we can jump off of, and efficiently develop AR for the CS department.
3. What needs to be changed?
 - A. As we are using existing software, we will look at how we can manipulate it to our liking and see how much modification we need/want to make to our final design.

Update As of 11/14/2019

1. Our new design is to work with ROAR or Zapworks to effectively create the AR effects desired.
 - A. We believe that both these software can accomplish what we desire, however, we are looking into the cost/benefit ratio of them a little more to determine which is best for our use.
2. ROAR seems to be a little easier to use, and could potentially be a easier and quicker option, possibly even more powerful. However, Zapworks is a lot cheaper to use for our design purpose.
3. We still need to do more research into Zapworks and ROAR to figure out on our final design. They both look good so far.

Update As of 12/12/2019

1. Before our Snapshot day #2, we decided to go with Zapworks as our first design. ROAR was simply just too expensive to be a viable option. Our plan is to first augment the CS department with Zapworks to get a working product, while developing an AR application of our own, that we can hopefully switch over to eventually.
2. We think that Zapworks will work really well as a way to just get the AR out in the CS department, while being a low-cost option. The Zapworks studio is easy to use, and we think we can populate the information easily. However, it does cost money to create more

AR effects, therefore, we want to make our own AR app, to cut down on cost, and ultimately give the University its own app to use for this purpose.

3. As of now, we need to start populating the CS department with AR effects on various objects like nameplates, old computers, signs. And also start creating our own AR app during the process, using Android Studio.

Big Change – as of 2/6

1. We have met with Terry and we have decided to make our own app instead of using a preexisting app, because of costs, and we have more freedom with our own.
2. We will be developing the app in Unity and using a library called Vuforia to get our image recognition.
3. There is a nice tutorial that will follow along with, as Cameron already has. The tutorial describes very well how to develop our AR app.
https://www.youtube.com/watch?v=MtiUx_szKbl

Update as of 3/24

1. Our app development is going well, we are working on getting sound effects and links into our app, as well as getting a good interface.
2. For the links, we are going to use a mesh collider in Unity so that we can detect when someone has clicked the link.
3. For the sound we are going to use event handlers to see when our image is detected and when it is not. Unity makes playing the sound quite simple.
4. For the interface of the main menu we will go with a basic structure of a few buttons that you can click and go to different scenes with different AR objects.

Update as of 4/30

1. Cameron has gotten the interface working.
2. Jubal has gotten the sound script working
3. Adam has gotten the link script working, so we have all the needed effects for our AR objects.
4. We have merged our code together, so we have a working app with all of our effects in it. And are ready to show it at the Expo.

Design Goals

1. Client need and project goal (with timeline)
 - A. Develop 12 different AR effects on various items/places around the CS department to help enhance students experience.
 - B. As we switched over to creating our own app, with sponsor permission, it affected the amount of AR effects we will have. So, we have 3 different AR effects including on Terry's nameplate, the I in the U of I logo.
2. Timeline

Meetings with Terry each Thursday as needed	Each Thursday
Examine Existing AR applications	10/8-11/26
Determine how much modification we can/need to make	10/8-11/26
Evaluate Pro's and Con's of examined AR apps	11/12-11/26
Select an AR application	12/3
Make needed modifications	End of 2nd Sem.
Populate application with information	End of 2nd Sem.
Create our own AR application	End of 2nd Sem.

Specifications & Constraints

1. Design specifications and constraints
 - a. The design/app shall work on both android and IOS devices.
 - b. All objects shall be able to be recognized by the phone's camera from at least front view, and hopefully from any angle that is possible.
 - c. The final product shall have a dozen objects that have an augmented reality applied and associated with them throughout the CS department or objects.
 - d. The AR app we choose to use may be free but is not limited to being free.
2. The design specification changed during the 2nd Semester (because of the change of making our own app.)
 - a. The app we develop will work with android devices and will be published to the Appstore.
 - b. All objects shall be able to be recognized by the phone's camera from at least front view.
 - c. The final product will have a few different effects to show at the Expo, and will have some for some k-12 students who will also be checking out our app.

Analysis of Alternatives

1. Discussion on possible apps we will use to do our project
 - A. Blippar
 - a. Quick AR development
 - b. Cost \$\$ per blip
 - c. Easy use and testing
 - B. SMACAR
 - a. Cannot test for free.
 - C. ROAR
 - a. Quick AR development
 - b. Cost \$\$ for us to develop, very expensive.
 - c. Easy use and testing.
 - D. Snapchat Lens Studio
 - a. Used mostly for facial recognition and AR drops rather than object Identification.
 - E. Sumerian
 - a. Used mostly for faces, and AR effects that we aren't looking for, like dropping 3D objects on a background, but not actually being able to interact with said object.
 - F. Google Lens
 - a. Very new technology, so only very new phones can use.
 - b. And cannot create your own AR effects, can only use the existing ones on the app

Zapworks

- a. Quick AR development
 - b. It does cost money, but not much.
 - c. Easy use and Testing.
 - d. Only one picture for object identification
 - e. Uses Zapcodes (QR codes)
2. After looking at all the alternatives we could use that are preexisting, we have decided to make our own app.
- A. Android Studios
 - a. Looked promising at first
 - b. Had quite a bit of documentation on creating AR
 - B. Unity
 - a. We are already familiar with Unity
 - b. We found a built-in library called Vuforia that allows easy AR recognition and development.
 - c. Unity makes it easy to do cross platform development

Appendices

Augmented Reality Product Requirements

Augmented Shenanigans
Cameron Dearien, Jubal Mitchell

Document History

Rev Number	Date	Modified By	Reason
0	9/26/2019	Jubal Mitchell	Initial Product Requirements

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Objective

The objective of this document is to document the requirements associated with the Augmented Reality Project.

Scope

The scope of this document is to define the requirements of the Augmented Reality Project

References

Acronyms

AR	Augmented Reality
App	Application
IOS	Apple Operating System

Functional Requirements

User Interface Requirements

The user needs to be able to look at an object through their phone's camera and be able to see or reach the augmented reality we design for said object.

Mechanical Requirements

Strength Requirements

The design/app shall work on both android and IOS devices.

Reliability Requirements

All objects shall be able to be recognized by the phone's camera from at least front view, and hopefully from any angle that is possible.

Software Requirements

Functionality

The final product shall have a dozen objects that have an augmented reality applied and associated with them throughout the CS department or objects.

User Interface

As we are using a software that already exists the user interface will depend on the app that we choose to use. Depending on said software, we may be able to change the user interface to a liking agreed upon by both authors.

Cost Requirements

Production Requirements

The AR app we choose to use may be free but is not limited to being free.

We may also create our own objects that we want to augment through 3D printing, purchasing, etc. but are not required to.

Schedule Requirements

The following are the major Project Milestones:

- Test various apps for development Oct 31, 2019
- Concept Design Nov 11, 2019
- UI Design EXPO May 1, 2020
- Final Report/Portfolio May 8, 2020
- Final Product May 8, 2020

Value Proposition

Value Proposition

Use Augmented Reality to provide information about the computer science department at U of I by attaching multimedia to objects around the department in augmented reality.

Project Poster

AUGMENTED REALITY

Team Members: Cameron Dearien, Adam Odell, and Jubal Mitchell

Lead Instructor: Bruce Bolden

Sponsor: Terence Soule, U of I CS Department



BACKGROUND

Augmented Reality (AR) is the idea of taking images from the real world and augmenting them with additional information in the virtual world. We were tasked to use Augmented Reality to provide information about the Computer Science Department at U of I attaching multimedia to objects around the Department in Augmented Reality. After searching through the possibility of using preexisting software, the costs were just too high. So, we along with our client decided to produce our own app to create the Augmented Reality.

OBJECTIVES

- 1 Create an Augmented Reality experience for the CS Department
- 2 Develop our own app for the Augmented Reality
- 3 Add Augmented Reality Experience for k-12 Students

DEVELOPMENT

We decided to use a combination of Unity and a library called Vuforia to get the job done.



VALIDATION

Overall, we got a variety of different Augmented Reality items working, along with various features, including links to websites, sounds, and displaying text and images. We created multiple AR experiences for the CS Department and the Expo, and a couple for some k-12 students who will be checking out our app from various different schools.

FINAL DESIGN

Here is an example of the working product, just download our app at <http://www2.cs.uidaho.edu/~tspoule/>, start it up, and point the camera at the picture below



Point Camera at name plate

Augmented Reality

