

# CS 100 Fall 2015

## Homework 4 (Group Project)

### M1 “Prototype”

**Milestone M1 due date is Tuesday 27 October. Submit by midnight - electronic submission to the CS portal for CS100: <http://www.cs.uky.edu/csportal>**

#### Overview

This assignment is a group project. Groups will be assigned – check list available on the CS100 website. Each group will have 4 members, and project objectives must be achieved together. For this assignment your group's designated *point of contact* (PoC) will turn in all items on behalf of the group through the PoC's portal:

<https://www.cs.uky.edu/csportal>

Instructions for turning in assignments via the portal are on the course web page at <http://dmn.netlab.uky.edu/~seales/cs100.html>

#### 1. Introduction

Virtual reality (VR) has promised for some time to change the way we interact with our environments - both real and digital. Right now there are various VR systems on the market: at the high end, the Oculus Rift (now owned by Facebook) arguably provides a “best-in-class” VR experience. On the less expensive side of the scale, the Durovis OpenDive system delivers a budget-friendly VR experience compatible with many Android and iOS devices.

You and your team are assembled to explore the potential in the low-cost virtual reality market. Using a *cell phone* as the guts, and *some lenses that we will provide*, your task is to explore a way to design a rich and immersive VR experience. To that end, you will participate in the following three phases of product design, testing, and reporting.

#### 2. Project Phases

##### **M1: Prototype (Due 27 Oct)**

All great ideas start with a prototype. Think of it as a pre-release version of your idea. It is in this phase where you will throw ideas to the wall and see what sticks. At the minimum, this phase should produce a functioning headset that someone can slide their *compatible* cell phone into, look inside, and experience a virtual world. Go wild and crazy in this phase!

To start you must *meet your team members and work up a design*. After week 1 of this milestone (i.e., on Tues 10/20 in class) we will give each group *two bi-convex 45mm focal length lenses*. With these lenses you will be able to make a split image on a cell phone that is a certain distance away look like it is right in front of you. Another name for this phenomenon is *stereoscopy*. The apps listed in section 3 (Phones and Apps) are example smart phone apps that will display stereoscopic images.

## What you need to do for Milestone 1 (M1)

- First week: find/meet your team members, discuss design ideas, establish work schedule.
- Second week: Your team must *build a simple prototype concept VR headset* using the lenses you are given (and any other materials you want to use) so that it holds the lenses the correct distance away from the phone screen and accommodates a group member's phone so that there is no danger of it falling out; remember: this is a *virtual reality headset*, so you will be looking around in all directions to observe a virtual world.
- Work on a sturdy design and **avoid expensive "drops"**.
- You should test it with some of the apps listed in section 3 (Phones and Apps).
- Document your prototype process, which must include the following:
  - Pictures of the whole group working on the prototype
  - Pictures or sketches of how your design will look
  - Short one page "lessons-learned" write-up – identify team members and PoC, and discuss the issues with the first milestone.
  - Video of group members testing the prototype

Designate a *team PoC* who will zip your team files together and submit them on behalf of the team to the CS portal by the due date.

## M2: Testing (Due 10 Nov)

In this phase, you will continue to develop and iterate on your ideas for a final product - this time using some additional guidance/support from us. We will provide more information in class on Tuesday 27 October about this milestone.

## M3: Reporting (Due 24 Nov)

With your design finalized, you will report on ("tell the story about") what you learned. This milestone is about making a compelling *pitch* of your ideas – something that could convince a manager to let you work on the project, or a group of investors to give you funding to build a better prototype.

For this phase you will submit a video telling the story of what you discovered and how it works – your pitch/report/story. More guidance about this phase will be provided in class.

## 3. Phones and Apps

Ideally, you will test your headset with one group member's phone. Please note that some phones work better than others. The phones that are known to work the best are listed here:

Samsung Galaxy Nexus

Nexus 4, Nexus 5

Samsung Galaxy S4

Motorola Moto X ('13/'14)

Motorola Moto G ('13/'14)

iPhone 4, iPhone 4s, iPhone 5, iPhone 5s, iPhone 6

iPhone 6+ (Note: You will have to make your headset larger to accommodate this phone)

These are all the phones that we know work fully; you can try other phones, but just know that they may not work fully or at all.

If you are testing your headset with an Android phone, try some of the following apps:

<https://play.google.com/store/apps/details?id=com.schoendevlopment.cardboardcatapult>  
<https://play.google.com/store/apps/details?id=com.divegames.divecitycoaster>  
<https://play.google.com/store/apps/details?id=com.google.samples.apps.cardboarddemo>  
<https://play.google.com/store/apps/details?id=com.JanRaacke.DiveVulcanoVRDemo&hl=en>

If you are testing with an Apple iPhone, try the following apps:

<https://itunes.apple.com/us/app/dive-city-rollercoaster/id771293168?mt=8>  
<https://itunes.apple.com/us/app/dive-zombie/id903661452?mt=8&ign-mpt=uo%3D4>  
<https://itunes.apple.com/us/app/stereoscopic-tunnel-effect/id658276824?mt=8>  
<https://itunes.apple.com/us/app/moorente/id820348776?mt=8>

#### 4. Timetable

Each team must meet the following project milestones (M1, M2, M3):

M1 (due 27 Oct)	Build prototype. Collect images, video. Write "lessons learned." PoC submits zip file of the project documentation by deadline.
M2 (due 10 Nov)	Iterate – more guidance provided on 27 Oct.
M3 (due 24 Nov)	Pitch video. Build pitch storyline as a video. PoC submits pitch by deadline. More guidance provided on 10 Nov.

#### 4. Evaluation

Your team will be evaluated as a group based on deliverables from each milestone. Those deliverables will be judged based on the following factors:

- Creativity of concept and strength of story-telling
- Technical expertise
- Adherence to specifications (did the deliverables meet the deadlines and requirements?)
- Participation of group (appropriate roles, engagement/contribution by all team members)

#### Frequently Asked Questions

Q: When will groups be assigned?

A: Tuesday 13 October 2015

Q: How will we know what group we are in?

A: The group assignments will be posted permanently to the class web page

Q: When is the first group meeting?

A: You are responsible for meeting your team members and arranging your first group meeting.

Q: If we make videos of ourselves working, may we put a song to our video(s)?

A: Yes.

Q: Can the song be "Wrecking Ball"?

A: No.

Q: I have no idea how to take a picture, capture a video, or edit a video. What do I do?

A: Decide as a group what your capabilities are. The e-Studio has a set of tools you may use for the project (note: you must schedule time and there are limited hours).

Q: How do I learn something if you did not teach it to me in person?

A: Try reading some things, and doing some on-line tutorials.

Q: Can I be in a group with <person X> because <reason Y>?

A: No, you had a chance to suggest group assignments. Now assignments are made and we will stick with them unless there are special circumstances.

Q: Can I be the Team PoC?

A: Team roles should be decided by the individual teams according to whatever process you prefer.

Q: I hate group projects and therefore will not participate

A: That is not a question

Q: I hate group projects. Is it ok if I do not participate?

A: No, it is not ok. You must do the assignment in the group to which you are assigned.

Q: I'm great at all these things and can do everything myself tonight on my cell phone.

A: That is not a question.

Q: Is it ok if I do the whole project myself on behalf of the team?

A: No, it is a group project. Much of the value is in working as a group.

Q: We all live in separate states and only come out when it rains (except Charlie, who only comes out when it snows). So how can we possibly work together?

A: Develop your team process and culture – find what works for your group. Consider writing a mission statement and putting it in your “lessons learned” write-up. Consider applying what you are learning from reading “Team Geek.”

Q: How much time is this supposed to take? (this class is only a 1-credit course, after all)

A: The project should be done over the next six weeks, requiring only a few hours per week. If you wait until the end to do everything you will not do as well as the other groups and it will not be a very fun project.

Q: Has anyone else ever thought about the problem of VR with a cell phone?

A: A quick google search might turn up some interesting related work, and you might have some fun poking around yourself. We stumbled onto this, for example:

[https://www.google.com/get/cardboard/downloads/wgwc\\_manufacturers\\_kit\\_v2.0.zip](https://www.google.com/get/cardboard/downloads/wgwc_manufacturers_kit_v2.0.zip)

## **Turning in your Work**

It is the Team PoC's responsibility to turn in all material for this assignment. PoCs: please submit materials to your portal. No late submissions will be accepted.