Scientist – Student Agreement

Robert Pastel, 10/3/2021

This document explains the relationships and agreements between students in the Computer Science courses, Human Factors course and Scientists sponsoring web applications. It details the expectations of responsibilities, time and effort of the sponsoring scientists and students.

Outline

1. Development Process

1.1 Computer Science, Human Factors and Humanities Courses

Two courses are involved in the web applications development:

1. CS4760 – Undergraduate Computer Science course in Human-Computer Interaction Design and Implementation.
2. CS5760 – Graduate Computer Science and Human Factors course in Human-Computer Interaction Evaluation and Testing

Both courses introduce user-centered design by involving student teams in projects developing citizen science apps for sponsoring scientists. Typically, the teams are composed of 5 students from CS4760 and one or two students from CS5760. The CS4760 students are primarily responsible for design and coding the app. The CS5760 students are primarily responsible for evaluation and usability testing of the apps.

The web app development process includes:

1. Gathering app requirements
2. Delineating potential app users
3. Determining tasks to perform on app
4. Determining help and assistance that user of the apps will need
5. Delineating usability issues
6. Initial paper prototype design
7. Refinement of design
8. Final design

9. Adjustments to final design
10. Implementing app
11. Designing usability test
12. Usability testing
13. Analyzing usability test results

The students attempt to accomplish all these design, development and evaluation steps in one semester, January to April, less than 4 months. This is an ambitious task for one semester. The teams need the scientists to provide timely input during the entire process. The goal is to implement the apps with sufficient functionality and fidelity so that the end product can be fairly evaluated, and the students' products can serve as a reliable and stable platform for further development of the apps.

The expected schedule for presentations and students - scientists meeting are listed on the next page, so that you can print it and save it for your reference.

1.2 Expected Schedule

A detailed spreadsheet of the CS4760 and CS 5760 course schedule can be downloaded from the CS4760 course website:

http://cs4760.csl.mtu.edu/2022/

Below is an expected schedule for the major design steps, meeting and presentations during the semester:

1/11/2022 – First day of class

1/18/2022 - 1/19/2022 – First meeting between teams and scientists

1/25/2022 - 1/26/2022 – Second follow-up meeting with teams and scientists

2/3/2022 and 2/11/2022 – Paper prototype design presentation

2/3/2022 - 2/14/2022 – Feedback from scientist on the paper prototype

3/29/2022 and 3/31/2022 – Final design presentation

3/29/2022 - 4/7/2022 – Feedback from the scientist for adjustment of the final design

4/19/2022 and 4/21/2022 – Usability test result presentations

4/19/2022 - 4/27/2022 – Feedback from scientists on usability test results

4/29/2022 – Last day of the semester including finals week

I suggest printing this page and saving it for reference during the semester.

2. Scientist Effort

The scientist's participation is required throughout the design, implementation and evaluations of the apps. In particular, the scientist is required to conceive an app idea, assist in requirement gathering and design, provide scientific technical support and provide feedback on the design and evaluations. Below describes some of the details of these requirements.

2.1 App Concept

The scientist is responsible for conceiving and communicating the app concept. The app concept is communicated in the 1/18/2022 - 1/19/2022 meeting with teams and refined during the 1/25/2022 - 1/26/2022 follow up meeting with teams. I will schedule these meetings with the scientists before the semester begins.

I have two suggestions when conceiving app ideas:

1. The app should be as simple as possible and clearly stated in one or two sentences. Complicated apps, apps with many options cannot be completed in single semester. Apps that cannot be concisely explained will not be understood by the teams and gathering all the requirements will be difficult.
2. Before the semester, the scientist and I will meet so that I can understand your app idea and assure that it is appropriately defined for the courses. This meeting typically takes one hour.

I will need your contact information before the semester begins and a brief description of the app, so the teams will have the material to select apps and contact scientists. I will need a document with:

1. Scientist Name
2. Scientist Title (description of your scientific expertise.)
3. Email address
4. Phone number (Only to be used as backup for conferencing.)
5. Office address
6. Preferred medium for meetings (e.g. in-person and room number, Zoom meeting, or phone.)
7. Descriptive App Name (This is not necessarily the name that the students will give the app.)
8. Paragraph description of App

The paragraph description of the app is not a description/specification of the design; rather it should motivate the app and give the general idea of the app. You can use last year's app description as examples, found at:

http://cs4760.csl.mtu.edu/2021/scientists-and-applications/

I will schedule the meetings with the teams and arrange for the meeting venue for the first two meetings with student teams and scientists. This can be a regular phone, conference phone, skype, google hangout or other software. The rest of the meetings for the semester will be schedule and arranged by the student teams.

I would like this document before winter break, 12/11/2022.

2.2 App Design

The scientist should assist with the app design. Components of the design that the scientists should consider are:

1. Tasks that the app will perform
2. Who will use the app
3. Where the app will be used and any special circumstances during use
4. What data the app will collect
5. How to save the data
6. How the data will be collected
7. How the data will be presented
8. Sequence of events using the app
9. Any graphical design of the app

Scientists do not have to address all of the above components, but these are the types of issues that the teams will need to consider. The amount of participation in the specification of these components is up to the scientist, but the more the scientist participates, the more precisely the vision of the app can be coordinated and the more successful the project will be.

2.3 Scientist Technical Support

Typically the students do not have experience or expertise in the scientist's field. They need technical support from the scientists. During my meetings with the scientists, I try to seek out potential documents that the scientist can give the students that will help the students during the design and development of the ideas. Examples of the documents are example data spreadsheets, photo of specimens, etc. Scientists should have the documents readily at hand to give the students during the first two meetings.

In addition, during my meetings with scientists, I try to delineate key data criteria, categories, and other technical aspects that the scientist should make decisions on before the first meeting. The scientists should have the key data aspects to give the students during the first meeting.

2.3 Meetings and Presentations with Students

Scientists will need to participate in the app design process by meeting with the team and watching team presentations. I have found that the best mode of communication is face to face, followed by conference calling or video conferencing using phone, Zoom or google meet. Email correspondence is the least effective. Nevertheless, all modes of communication will need to be used, except in the case of off-campus scientists, where face-to-face communication is unlikely.

Following are scheduled meeting dates and the expected focus of each meeting.

> **1/18/2022 - 1/19/2022 – First meeting between teams and scientists.** The teams will learn about the app idea from the scientist; including what tasks are to be performed with the app, users of the app, where the app is to be used, etc. The meeting should last between 30 – 60 minutes.

> **1/25/2022 - 1/26/2022 – Second follow-up meeting with teams and scientists.** This second meeting allows teams to ask follow up questions after they have thought about the app idea over the weekend. The meeting should last between 30 – 60 minutes.

2/3/2022 and 2/11/2022 – Paper prototype design presentation. In this presentation, teams present their designs, working through the apps' tasks using paper prototype. Each team has 30 minutes to present their design, answer questions and received suggestions from the rest of the teams and scientists. The presentation will be scheduled and videotaped. Scientists only need to attend the presentation for their app. It is best if the scientists attend the presentation live or by conference call, but scientists can view the videos later if they cannot be present. If attending the presentations, you will be given an opportunity to ask questions. Please ask questions that you require immediate answers for your understanding because time is short during the presentations. You will meet with your development team after the presentation and can ask longer questions then. Links to the video will be posted on the course website the evening of the presentation or the following day.

2/3/2022 - 2/14/2022 – Feedback from scientist on the paper prototype. During this meeting, scientists can provide detailed feedback of the design presented in the paper prototype presentation. The meeting should last between 30 – 60 minutes.

3/29/2022 and 3/31/2022 – Final design presentation. In this presentation, teams present their design by working through apps' tasks using a partially implemented app. Each team has 30 minutes to present their design, answer question and received suggestions from the rest of the teams and scientists. The presentation will be scheduled and videotaped. Scientists only need to attend the presentation of their app. It is best if the scientists can attend the presentation live, but scientists can view the videos later. Links to the video will be posted on the course website the evening of the presentation or the following day.

3/29/2022 - 4/7/2022 – Feedback from the scientist for adjustment of the final design. During this meeting, scientists can provide detailed feedback on the presented design. Because the students should have already implemented a significant portion of the app, only minor adjustments can be made. The student teams should decide if they have time to implement the changes and will advise the scientist so. The meeting should last between 30 – 60 minutes.

4/19/2022 and 4/21/2022 – Usability test result presentations. During the prior week, teams will have tested their app using students from other classes. In this presentation, graduate students present preliminary results of the usability tests. Each team has 30 minutes to present their design, answer questions and received suggestions from the rest of the teams and scientists. The presentation will be scheduled and videotaped. Scientists only need to attend the presentation of their app. It is best if the scientists could attend the presentation live, but scientists can view the videos later. Links to the video will be posted on the course website the evening of the presentation or the following day.

4/19/2022 - 4/27/2022 – Feedback from scientists on usability test results. During this meeting, graduate students give details of the usability test results. Scientists, teams and graduate students can discuss changes to a new version of the app as a result of the usability test results. The meeting should last between 30 – 60 minutes.

The above schedule implies that there are 8 "scheduled meetings and video presentations" of about one half hour to an hour each, but additional meetings for gathering app requirements may also be needed in the first seven weeks of the semester, depending on the complexity of the app and how precisely the app concept has been defined prior to the beginning of the project. The teams will be responsible for arranging the meetings. They will try to minimize any extra meetings, but it is important for the scientists to respond in a timely manner to the teams' requests for further meetings. In addition to meetings, team may use emails to communicate. Both scientists and teams should be responsive to answering emails.

Note that the teams maintain a website for posting their design documents. Links to the teams' project website will be available on the CS4760 course website. The project website will be continuously available after the second week of the semester. Scientists will find these websites invaluable for learning about app design details and progress.

3. Student Team Effort

The student teams are responsible for the design, implementation and evaluation of the apps. Teams are not responsible for the initial app idea, but they should ensure that they understand the app idea and gather all the requirements for implementing the app. Below are details of the student teams' responsibilities with regard to implementing the app.

3.1 App Design, Implementation and Evaluation

Students in CS4760 are responsible for gathering requirements and the design of the app. Students delineate

1. App users
2. App tasks
3. App graphical design
4. App details, such as wording etc.
5. App usability issues

Students in CS4760 responsible for maintaining their projects' websites.

Students in CS4760 are responsible for the implementation/coding of the web app.

Students in CS5760 are responsible for assisting in identifying users and making a hierarchal task analysis of the app. Most important, students in CS5760 are responsible for evaluating the app design during the semester and at the end of the semester preform a usability test. Students in CS4760 will assist with the usability testing.

Students in CS5760 are also responsible for maintaining their own website and posting their evaluations on the website.

More details about the responsibility of CS5760 students are available in the assignments for the course.

3.2 Meetings and Presentations with Scientists

I will try to arrange for the first two meetings with scientists, but the teams are responsible for arranging the additional meetings. Three additional meeting are required after the paper prototype, final design presentation and usability test result presentations. The meetings should occur as soon as possible after team has presented and the scientists have seen the video:

> **2/3/2022 and 2/11/2022 – Feedback from scientist on the paper prototype**. During this meeting between scientists and teams, scientists will provide detail feedback of the design presented in the paper prototype presentation. The meeting should last between 30 – 60 minutes.

> **2/3/2022 - 2/14/2022 – Feedback from the scientist for adjustment of the final design.** During this meeting between scientists and teams, scientists will provide detailed feedback of the design presented in the final design presentation. Because the students should have already implemented a significant portion of the app, only minor adjustments can be made. The student teams should decide if there is time to implement the changes and advise the scientist so. The meeting should last between 30 – 60 minutes.

> **3/29/2022 - 4/7/2022 – Feedback from scientists on usability test results.** Grad students will describe the usability test results. Scientists, teams and graduate students can discuss changes to a new version of the app. The meeting should last between 30 – 60 minutes.

For all the "scheduled meetings," the teams are responsible for

1. Arranging the exact date and time for the "scheduled meeting" during the assigned week.
2. Planning for the meeting by typing pre-meeting notes
3. Recording meeting notes during the meetings
4. Posting on the project website the meeting notes.

Teams may need more meetings to assure that they completely understand the app and have gathered all the requirements. Teams should ensure that they gathered all the requirements early in the semester, but it is not unusual for a requirement to be discovered only late in the design. Try to minimize the number and impact these late requirements, by understanding as much of the app design early in the semester. By the fourth week of the semester the teams should have gathered all the important requirements. Teams may need additional meetings with the scientists to gather these requirements and will have the same responsibilities as those listed for the "scheduled meetings." Teams should be careful to minimize these meetings by being respectful of the scientists' time.

In order to assure that the app is implemented in time for usability tests, the teams should have gathered all detailed requirements by the seventh week of the semester.

Teams can also use emails to communicate with the scientists to ask quickly detail questions. Teams should be responsive in answering to any scientist email by answering email within 24 hours.