ECE 1778 – Creative Applications for Mobile Devices
February 2020
Specialist Assignment S4

Estimates and Trade-offs in Your Project

The core purpose of this course is to create an interesting and evocative application in your field as a specialist. From Assignment S3, you will have generated many ideas, some of which won't be doable at all, and some that will have to be evolved and honed to be able to fit them into the time allowed.

From Part 4 of Assignment 3, you have already gone through an exercise to prioritize the most important features of your proposed application – the priorities were based on some discussions with the programmers in your group.

In this Assignment, you are to work in greater detail with the top 3 features of your application, and to break these down into more pieces. You can choose to talk about more than the top three if you feel that is appropriate.

For each of the top three (or more) features that you described in Part 5 of Assignment S3, do the following:

1. Write a 1-2 paragraph description of that feature's specific goals.
2. Break the feature into its constituent sub-features. For example, a list may have several items in the list. Provide a short description of how each sub-feature functions within the whole and how it interacts with the other sub-features, if applicable. These sub-feature descriptions should be as short as possible (aim for a sentence or two).
3. Draw a mock-up, using Marvel, of the feature.
4. Using the mockup, consult with your programmers to estimate the number of programmer hours that are required to build each sub-feature and the total number of hours for the completed feature. Be sure to put in lots of 'margin' for error in these estimations.
5. Determine if there are any major risks or infeasible parts of building the feature. A few examples of risks are:
   - Requiring new data for a data-driven (e.g. AI/ML) feature. Collecting new usable data is very time consuming, and the data may not contain the information that you hoped it would.
   - Using 3rd-party libraries/software (e.g., augmented reality [AR], computer vision tasks, indoor localization, many more) to implement a mission-critical component of the app. This is particularly risky if the library or software is experimental, not mature, or it is unknown how well the library or software will perform in your specific setting.
   - Implementing complex algorithms, techniques, or analyses that you may have found in the literature or seen in other apps, but are beyond the abilities of the programmers to build. Programmers must provide an honest

assessment of their skills, capabilities, and experience. An example here might be a sophisticated processing of sound that requires good digital signal processing skills.

Once you have done this with the top 3 features, include a Summary Statement, which is include two parts:

First: calculate the total amount of estimated time to develop this much of the app. Compare the time calculated with the time available to the end of the project (you'll need to get the dates from the lecture slides, and make estimates with the collaboration of your programmers, of how much time the programmers actually have during that period), and determine if there is time to build the features. If there is not sufficient time, discuss which features and sub-features should be eliminated and why.

Second: count the number of major risks and infeasible parts, and report all of these. For each, provide an alternative or fallback measure to be used if the risk was realized. If no alternatives or fallbacks are appropriate, explain how the app will work without that component.

Due: Tuesday February 11th, at 6pm, 0.5 marks off every hour late.

Submit your PDF document on Quercus, under Specialist Assignment S4.

Grading Guidelines/Rubric:

Total Marks: 30

3 x Feature Descriptions and Breakdowns (9 marks x 3 = 27 marks)
- Item 1: **4 marks** for clearly explaining the feature, contextualizing and clearly explaining how the feature's goals help drive the app towards the overall goal of your project
- Item 2: **2 marks** for a logical breakdown of the feature into its constituent parts.
- Item 3: **1 mark** for a clear mockup which helps to illustrate the function of the feature
- Item 4: **1 mark** for a time estimate that shows evidence of an understanding of how much work is involved.
- Item 5: **1 mark** for evidence of honest reflection on risks. You are not required to identify a risk where there isn't one in order to receive this mark. If you feel there are no risks for a certain feature please provide a plausible argument as to why.

Summary Statement (3 marks)
- Time Breakdown: **2 marks** for estimate of total time available and comparison to projected time requirements for the feature set
- Overall Risk Assessment: **1 mark** for some contingency plans to be used in the event that risks are realized