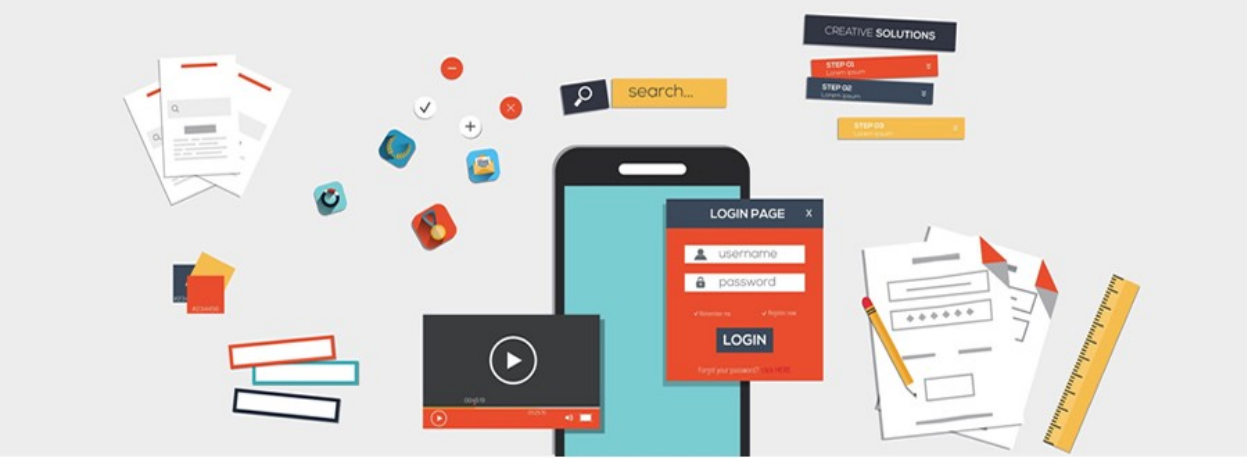

Project

Throughout the course, you will be involved in a group project: conceptualizing, designing, implementing, testing, and refining a system that will evolve from a paper description, to a simple prototype, and finally to a functional system.

Note that whatever you choose to develop may already exist in some other form, in which case, one of your initial tasks in the first project deliverable will be to critique the existing version and identify what you consider to be its significant shortcomings that warrant you "re-inventing the wheel". Alternatively, your project idea may be inspired by a concept description, but not available in a functional implementation, or it may be something completely of your own invention. In any event, what we will be focusing on in our evaluation of your work is not the application itself, but rather, your ability to:

- Evaluate or define some computing-related task or problem
- Design a solution to the task or problem
- Implement a prototype of your design
- Evaluate your design in a user-study

Note: You are free to incorporate hardware components or re-use existing software, with proper acknowledgment. In terms of hardware we have the following available to you: Hololens, Kinect, Oculus Rift, Google Daydream, Asus Zenfone, Google Cardboard, EEG equipment, etc. ***Please note because of the pandemic, I'm still in the process of checking how these can be provided to you, but if interested please contact me.**

Each project team should consist of four, five or six students, although exceptions may be made in consultation with the instructor. Each project group will be graded as a team, i.e., each member of a group will receive the same grade. If necessary, instructors will poll team members to check whether each member is making a proper contribution. *Lack of participation by any individual may precipitate a grade reduction for that individual.* Within the team, you must negotiate on how much and what each person will contribute. Think carefully about your team members: Where do people live and what hours do they work? What skills do the different individuals bring to the group?

The purpose of the project is to gain experience in applying concepts and techniques from the class to a real-world problem. What is most important to keep in mind is that your project marks are not determined by a wealth of functionality, nor by the complexity of what you tackle. Remember: this is a course on human-computer interaction and UX/UI design.

The project will have the following milestones:

- Project Pitch (just feedback on your idea)
- Project Proposal
- Background Research and Objectives
- Final Report and Deliverables

PROJECT PITCH — ASAP/LATEST FEB 15

To pitch your team's idea use the Moodle forum to describe your project (what are you planning to do, what problem are you trying to address, etc.) The publicly posted pitches, along with the feedback to be provided by the instructor and course TAs, are intended to help you quickly form project teams, decide on the specifics of your project topic, and begin preparation of your first formal deliverable, the "project proposal". Note the sooner you post your pitch, the earlier you will get feedback to get started on the next step of the project.

PROJECT DESCRIPTION

For each part of the project, each group must submit a written report. Each report must follow a defined structure. Details about the structure are provided below. The reason that we enforce this structure is that the grading criteria will be based directly on the content that is defined by the structure. Feel free to add to the structure when you have additional relevant, or interesting content.

As with any written report, in addition to grading the document based on content, we will also be grading based on degree of professional preparation, expressiveness, grammatical soundness, and the ease with which it can be viewed and understood. ***A good design effort can easily be hampered by a poor communication of what was done.*** Make sure that you produce a report that is illustrative of your efforts and process.

Finally, **late submissions will not be accepted**. You must meet the deadlines.
The project proposal involves forming your team of up to 6 (some exceptions will be considered) and picking your project topic. Note the more people in a group, the more involved your project should be. If you do not have a group, please use the discussion forum on Moodle to find a group.

PROJECT PROPOSAL (5%) — DUE FEBRUARY 26

To "propose" your idea, write a brief description of the problem. As you do so, it is important to keep in mind that in HCI, you aren't developing technology for yourself, and while your group will certainly need to engage in a computer-based development activity, you will be marked according on the interface and interaction design, not on the marvels of your underlying engineering work.

You are encouraged to generate your own project idea, however you may also choose from the following projects here. There are two important keystones to finding a good topic: 1) read a lot of papers in an area of interest, and 2) generate a lot of ideas.

Your project proposal should include:

- A description of the problem you are addressing
- Your research question/challenge
- Your hypothesis
- The reasoning behind why you think what you are proposing is important
- A description of your intended user population

- An explanation of why you think that you could develop a prototype solution with a relatively modest amount of implementation effort
- A summary of the software, hardware, and other skills that you expect to need in team members to accomplish the project

GRADING SCHEME

CLARITY OF REPORT **/ 5**

It is important that your pitch is well written so that mistakes (grammar and spelling) do not take away from the content and your work. Your proposal should be easy to understand, well-structured and interesting to the reader. Diagrams or analyses can be used to enhance and clarify the presentation of ideas.

** *Note that many resources are available in order to help with this (Grammarly, Concordia Writing Center, proof readers, etc.*)

COMPLETENESS **/ 10**

- Description of the problem and why it's relevant/important
- Research question and hypothesis
- Intended population
- Prototype description, how it would address the problem
- Hardware/software development, needs, etc.

RESEARCH AND OBJECTIVES (25%) MARCH 26

The key goal of this first substantive part of the project is to deeply understand the **problem space** that you are addressing, its set of pertinent users, and the issues and constraints that are involved in the problem. If other systems exist that address the problem you are studying, you should perform an evaluation of them. What are the shortcomings and challenges that continue to exist? Also read research in your area of study, use Google scholar and see what research has been done — how does the research inform your project, and where does your work transcend this knowledge.

The most important goal here is to do **research** and identify important characteristics of the problem that will influence your design. A major mistake that students make on this part is to suggest potential solutions without first identifying *the problem* and *its characteristics*. You'll have plenty of time for developing a solution, for now, suppress the urge to problem-solve and concentrate your efforts fully on developing an in-depth understanding of the problem at hand.

Based on your research, you will start to get an idea of how you want to address the problem at hand and the methods you will use to do so. The deliverable for this part is a proposal is a report with the first sections of a research paper. You are encouraged to use a template from an HCI journal or conference. The report should be 2-5 pages and have the following sections:

RESEARCH AND OBJECTIVES

Introduction: What will you do? What are you trying to answer? What problem are you trying to solve, for who and why? State this as clearly as possible.

Hypothesis: what do you think the answer to your question is, and why? State your hypothesis in terms that you will actually be able to deliver on within the space of a quarter. (For example, having a technology increase someone's income might be your ultimate goal, but you may not be able to measure a change in income in 5 weeks. In this case, increasing income could be part of your motivation, but not your hypothesis. Your hypothesis needs a more proximal measure.)

Theoretical contribution: What motivates you to explore this issue? What leads you to believe this is a problem/opportunity? And what are the theoretical contributions of your work to existing research in your area? What is the structure of the space of possibilities that your work explores? What are the major decisions from a design perspective and what are their relative merits?

Background/Related Work: Please describe several pieces of published research, how they inform your project, and where your work transcends this knowledge. If other commercials systems exist you should also describe these and their shortcoming, thus motivating your work. Be sure to properly cite your related work.

Methods: Describe the development of the system. What tools (software/packages/hardware) will you use? What will be the main functionality of your system.

Evaluation: How will you explore your hypothesis, and why is that the right approach? Grounding this in methodologies that other researchers have used (e.g. by drawing from the class readings) is a good idea. This section should include the study design: What are you going to do? Make sure your study, and the variables you're measuring, properly address the question you are asking. Be very detailed and precise. How will you know you succeeded? What will you measure? How will you measure it?

Biggest Risk: what's the riskiest component of your project? (may not be able to get the *hardware you need, robustly implementing the ___, algorithm may take too long, the difference between conditions may not be measurable, …) How do you plan on mitigating these risks?*

GRADING SCHEME
The proposal will be evaluated based on its **clarity**, **completeness** and **technical quality**.

CLARITY OF REPORT **/ 5**
It is important that your proposal is well written so that mistakes (grammar and spelling) do not take away from the content and your work. Your proposal should be easy to understand, well-structured and interesting to the reader. Diagrams or analyses ca be used to enhance and clarify the presentation of ideas.
** *Note that many resources are available in order to help with this (Grammarly, Concordia Writing Center, proof readers, etc.*)

COMPLETENESS **/ 3**
Have you addressed all of the points in the guidelines?
- All sections are present.

CONTENT
- The research question/project goal are clearly stated and addressed **/ 3**
- Hypothesis: what do you think the answer to your research question is and why? **/ 3**
- Theoretical contribution, motivation, clear and well stated **/ 3**
- You've demonstrated sufficient knowledge of the literature/related work. **/ 5**
- Methods — System/features make sense in terms of project goals. **/ 5**
- Evaluation and Study Design — What are you going to do? What will you measure? How will you measure it? **/ 7**
- Biggest risk — Riskiest component of your project? How will you mitigate the risks? **/ 1**

FINAL REPORT (75%) **LAST DAY OF CLASSES**

The key goals between the proposal and the final report will be to finish the design and implementation of your prototype, to evaluate it with users, and to write up your report. Note for the evaluation you may need to file an extra Ethics proposal to the department. You will get feedback during the proposal stage when you determine how you will run your study as to whether you will need a to do so or not.

The project final report and deliverables include a 2-3 mins teaser video describing your work (optional) (e.g. https://www.youtube.com/watch?v=ZAvqtyKnAiE), any implementations you have done (code on GitHub, webpage address, etc.), as well as a report of ~8 pages following the structure of a research paper. Again, it may be good to use a template from an HCI journal or conference. Note you will draw on your proposal for the first part of the report so the more thorough the proposal the less work you will in the first sections of the final report. The report should have the following sections:

FINAL REPORT

Abstract: Short abstract about the research question, methods and results.

Introduction: As in proposal should discuss, hypothesis, related work, etc.

Related Work: As in the proposal, expanded on if needed.

Methods: As in the proposal, expanded based on what you did.

Evaluation: As in the proposal, expanded based on what you did.

Results: A description of the output and results of your work, the evaluation of your method with performance evaluations, statistics, graphs, etc. How did your study address your research question?

Discussion: A discussion of the relevance of the solution/results, comparison to other papers and the literature. Limitations of your work.

Conclusion: Summarize what you have done and conclude with the main message results of the paper and possible directions for future work.

Appendices: Raw data (if applicable). All original observations/recordings, etc. should be attached here. For example, notes you have taken during the process or photos of your subjects, video clips, filled out if questionnaires, (make sure you have the subject's permission to do so).

GRADING SCHEME

The project report will be evaluated based on its **clarity**, **completeness** and **technical quality**.

CLARITY OF REPORT **/ 5**

It is important that your report is well written so that mistakes (grammar and spelling) do not take away from the content and your work. Your report should be easy to understand, well-structured and interesting to the reader. Diagrams or analyses should be used to enhance and clarify the presentation of ideas.

** *Note that many resources are available in order to help with this (Grammarly, Concordia Writing Center, proof readers, etc.*)

COMPLETENESS **/ 10**

Have you addressed all of the points in the guidelines?

- All sections are present.
- The research question/project goal and hypothesis are clearly stated and addressed.
- You've demonstrated sufficient knowledge of the literature/related work.
- Details on the methods of your implementations are given.
- Details are given to determine the goal of the evaluation and how the evaluations were done.
- The results are given and **interpreted**.
- Discussion, conclusions, references and appendices are present.
- Potential extensions and future work is described.

TECHNICAL MERIT (HCI/UC/UI) **/ 20**

- A concise and detailed description of methods is given. Think about if someone could replicate the work given your Methods section.
- The evaluation addresses your research question; and the chosen methods are appropriate.
- The conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.
- Thorough analysis of the results has been done.

DEVELOPMENT **/5**

- Code is available on GitHub.
- The prototype is functioning.
- Code well documented and understandable.

KNOWLEDGE GAINED **/5**

It should be evident from the project that you have gained knowledge and understanding about HCI/UX/UI (e.g. principles, technologies, evaluations, frameworks, etc.) from the course. For example, you've:

- Demonstrated knowledge of the course content by integrating concepts into the report.
- Demonstrated evidence of extensive research effort and a depth of thinking about the topic