

COMP 3020 Project Overview

The project is a hands-on opportunity to apply the methods and ideas that we cover and discuss in class. It will touch upon all phases of the user-centered design process, each milestone building on the last.

MS #	%	Summary of tasks
Milestone 0	0%	Team building and contract: get to know your project group and make important decisions, such as communication method.
Milestone 1	20%	Designer sense and ideation: consider what you interact with and explain what makes for good or bad interactions; determine general project direction and start investigating.
Milestone 2	20%	Low-fidelity prototypes: come up with ideas and progressively develop them into a functional, low-fidelity prototype.
Milestone 3	45%	High-fidelity prototypes: develop your low-fidelity prototype into a functional high-fidelity vertical prototype.
Milestone 4	15%	Evaluation and recommendations: evaluate your high-fidelity prototype using a heuristic evaluation.

Project Focus

The focus of this project is to re-envision and explore fresh ideas for a system that supports some aspect of University campus life. You are free to focus on any aspect of campus life, including but not limited to campus navigation, food, events,, etc. You are encouraged to think of fun ideas as the more unique ideas may have more room for creativity and novelty. Furthermore, consider an aspect of campus life that is either not currently supported well supported by technology or is not supported at all – you do not want to end up recreating an existing solution.

You will design, prototype, implement (using JavaScript, CSS, and HTML), and evaluate a novel interface. Keep in mind that you are not your user, your system is not just for personal use.

Project Teams

The project is to be completed in **teams of four or five people**. Your instructor will assign you to a team.

Working in teams can be challenging. Learning how to work in a group is one of our desired outcomes for the course, particularly given that almost all HCI work is done in teams. The following contains some excellent tips for effective group work: <http://www.cs.cmu.edu/~pausch/Randy/tipoForGroups.html>

A note about teams: some teams will have communication problems, or work distribution problems. ALL team members are responsible for effective team functioning. **If you are the one doing all the work and trying hard to drag everyone through the motions, you have just as much responsibility to fix the problem as those not working** - that is a part of the academic exercise, and groups that function well will produce better work. When an issue arises, arranging a friendly, constructive meeting with all group members present can be a good first step towards resolution. Only in extreme cases should you contact your instructor. Waiting until the end of term, or just before a milestone deadline, to solve the problem is too late.

General Requirements

All milestones have the following requirements. Markers reserve the right to dock marks if a requirement is not met, with increasing severity for repeated submissions missing the requirement.

- Use a cover page that shows your group number and all members' names and email addresses.

- Before starting a milestone, prepare approximately half a page listing how the milestone's tasks will be distributed among group members, i.e., what does everyone *plan* on contributing to that milestone. After completing the milestone but before submitting it, prepare another half page listing what everyone *did*. All group members must agree to the veracity of these half pages. In case of doubt if a task should be included or not, include it. This planning and debriefing exercise is not to judge group members but is meant as a tool to learn how to distribute tasks the next time. We will only check that the exercise was completed, we will not evaluate task distribution. Submit the two half pages (they can be combined on one page if you wish) as part of the appendix to the milestone. Overall, you should spend about an hour for these discussions.
- You must use inclusive language where appropriate. For example, if you are talking about an unspecified user, you should use gender inclusive language (e.g., they/them), but if you are talking about a specific user, you can use language appropriate to their identity, if known (e.g., she/her). This is true for all language, not just pronouns and not just for gender (e.g., spokesman → spokesperson, husband/wife → partner, stakeholder → impacted group). It may sound awkward at times, but it's through practicing that it becomes easier.
- Deliverables will be **submitted as single PDFs per milestone**, except where otherwise noted. Some milestones have physical components that must be handed in. Plan ahead of time to make sure these physical components are handed to the instructor before the deadline, at the beginning of class on the day that it is due. Your instructor will not be available throughout the day to accept submissions.

Tips for a Completing a Successful Project

- Writing is hard. Plan to put time into revisions, to be detailed yet concise. Have all group members review drafts. Multiple pairs of eyes are critical to catching writing flaws. Leverage each other!!!
- Your group will be intimately familiar with the details of your project, the markers aren't. You will have to be explicit when writing about justifications for decisions, making the links in your logic clear. For example, consider explaining why a concept was relevant, or how you applied that concept. Doing this concisely is very challenging.
- You will be often moving between working on paper and preparing digital submissions. Consider a free tool such as Office Lens to scan your papers using a smart phone.
- Read instructions for the milestone **very carefully** before starting and refer to them frequently. Double check the milestone instructions before submitting.

Milestone Marking

All milestones will be marked according to the following rubric. This rubric uses a non-linear scale to represent the quality of the work submitted. Markers will not follow these exact numbers (e.g., can give $\frac{1}{2}$ or $\frac{1}{4}$ marks if the quality falls in between scale items), but they should be accurate when describing the quality of your work.

- 5 – beyond expectations, amazing
- 4 – great work, all required components covered and done well
- 3.5 – good work overall with most things done well
- 3 – OK work, some things done well, some things lacking
- 2.5 – minimally acceptable work with many components lacking
- 2 – poor work with only a few components done well
- 1 – very poor work with little knowledge demonstrated
- 0 – not submitted or extremely poor

Further, some items will have heavier weights (e.g., /15 instead of /5, but this does not necessarily mean we are looking for three different things for that item). Each section also contains a spot for short, concise marker feedback on that section.

Mark Inquiry Policy

Students in HCI can sometimes get emotional when receiving a poor grade. Unfortunately, it's a catch-22: if you are struggling with the material, you may not even see the flaws with your work, and thus getting negative feedback can feel unfair and unclear. We get it!

You are always welcome to ask for us to re-check marking or to provide more feedback on your marks. However, to streamline and simplify the process we have rules that need to be followed:

- Wait at least 48 hours before sending in a complaint or request. Why: this gives time for emotions to settle down and for everyone to think more rationally. It's common for students to complain first, but then accept their mark after having time to reflect.
- We will open a dropbox the day following the release of a milestone's feedback. Carefully write a clear explanation as to why you think your grade should be re-evaluated, ideally referencing in-class/required content supporting your appeal. The appeal box will close in five business days following its opening. Appeals received by email, in-person, or past the deadline will not be considered. Appeals will be visible by all group members, only one member needs to submit an appeal.

COMP 3020 Project Milestone 0: Team Contract

(Thanks to [Dr. Law](#) for the assignment details)

The team must meet and complete the team building exercise, which includes the drafting of a team contract, team roles, and other fun ice breaker activities.

Your team contract should contain answers to the following questions:

- What does each member of the team want to get out of working on this project? Is everyone here to accomplish the same thing? What are your goals as a team collectively?
 - o It is acceptable to have different goals and acknowledging them can help create a supportive environment.
- How will you communicate? What are your expectations regarding the timeliness of responses to emails / forum messages?
- What do you expect team members to do prior to each meeting?
- How are you going to structure the work? When will you meet? What process will you use to assign the responsibilities?
 - o Remember to note down these decisions as part of milestones' submissions.
- How will the deliverables be submitted? Do you expect all members of the team to have a chance to vet the submission before it goes out? When should the writeup be ready for everyone to review?
 - o Only one team member needs to make project submissions. All team members should be able to see submissions on UMLearn.
- How will you deal with surprises? What should an individual do when they have a hard time delivering on something they promised either because it was harder than expected or because of an unexpected life event? How will the team respond?
- How will you manage turn-taking? How will you ensure that all people contribute to the conversations? How would you ensure that decision making is thorough yet expedient?
- What are your expectations around the attitude of team members in the weekly meeting, and how you should respond to each other's ideas?
- How will you handle conflict? If any member on the team feels that something is not going right on the team, how would they signal it? How will the team respond?
- What team roles do you think are necessary for success of your project? Who will be assigned which team role? Consider each team member's strengths and weaknesses, and how team roles can help everyone learn or capitalize on their strengths.

COMP 3020 Project Milestone 1: Designer Sense and Ideation

Part (a): Develop your designer sense

(Credit to [Dr. Tony Tang](#) for the assignment!)

The goal of this assignment is to help you become more aware of the things you interact with each day and what makes them enjoyable (or not) to interact with. For this assignment you need to have a very critical and reflective perspective. Your job is to "think like a designer," and experience the world while being cognizant of how it was designed. Pay attention to everything that you interact with: the alarm clock that wakes you up, the schedule that you look at to catch the bus, the controls in your car and even the feel of the steering wheel, the ways in which doors open, the interface of your phone as you text, etc. What things work well? What things don't work well? Why? Does it match your expectations? Is it because you know how from experience, or because you made lots of mistakes in the past? Are there things that don't work well, but you've constructed a workaround for (for example: creating a path through a field, because the walkway takes an inconvenient route)?

Many computer science students find this exercise difficult - maybe you don't think about things in such terms. That is the core purpose of this milestone: to train you to turn on your designer sense.

Warning: as soon as you start thinking in this way, the whole world will seem very poorly designed. Actually, the funny thing is that it really is, but humans are very adaptable, so we soon forget.

Complete the following tasks.

- **Explore.** Each team member should complete this task independently. Briefly describe 10 interactions you have had with things in your everyday life. Keep good notes and provide a single paragraph for each, describe this interaction, discussing whether it was successful or not. In what ways was it successful? In what ways was it poor? Why was it poor? What workarounds did you come up with to overcome these problems? Note: it is best to keep a small notebook with you so that you can record these in detail as you go about your life. Trying to recall them in the evening or several days later will be difficult and lack the clarity and richness of recording it in the moment.

Deliverable: This will not be marked, but each member must include their 10 paragraphs in an appendix. This can be rough.

Deliverable: As a group, review each other's interaction paragraphs and select the best 10. Revise and polish the writing and present the 10 paragraphs.

- **Design Principles.** Meet as a group and go over each other's results. As a team, come up with 5 design principles that could explain a good interaction, or a poor one. Most will make up their own principle based on their results, but do not worry if your principles resemble ones from class (we will review "actual" design principles later in the course).

Deliverable: For each of the 5 principles:

- Give it a name. It should be reasonably descriptive of the principle (not the interaction).
- Provide a 1 paragraph description of what it means.
- In one paragraph, use your principle to explain any of the good and/or bad examples from above.
- **Your principles and examples must draw from your exploration task.**

Part (b): Observing Users

At this stage, you should have a general idea of the interface or the details of what you want to build for your class project. Now, you will be doing some initial investigation to start ideating. Find an app/website that supports the same kind of interaction that you have chosen to focus on, or if you can't find one (or the ones you do find are so bad as to be irrelevant), an app/website for something that you think has something in common with your project emphasis. For example, if there are no good campus event apps/websites, you can consider using one that is for concerts, or anything else, as long as there are some similarities. However, be careful you don't later fall into the trap of recreating the concert app, but for campus events.

Recruit 5 people total (not each) from your friends and family network: you will ask them to complete some tasks relating to your project, using the app/website you selected. You will conduct your observations one participant at a time (not in groups) and will take notes on their experience. Ideally, you want two group members present, e.g., one taking notes, one interacting with the participant. Every participant should use the same app/website. For each person recruited:

- Thank them for giving you their time! Consider an honorarium, e.g., a chocolate bar or free coffee.
- Ask them to use the app you selected to complete one, two or three appropriate tasks. If the tasks are pretty simple do more, if it is a more complex task, just do one – you decide.
- Pay close attention ("Look") and take good notes on paper. Did everything go smoothly? Which parts seemed to work well? Did they have problems? Were there annoyances? Did they get stuck?
- Have some structure (specific steps, etc.) and additional materials prepared in case they don't know what to do (especially important if the task is complex).
 - Offer a rough task, e.g., find an item, do something with an item, complete a transaction.
 - If they are still uncomfortable, offer a detailed task, specifying the exact items.
 - Your goal here is to get them to use the system and to see them do it. **Prepare your helper tasks ahead of time**, do not do it on the fly.
- After interaction, "Ask" the person what they liked about the interface. Also ask what they did not like about the interface (make sure these are separate questions).

Deliverable:

- Describe the app/website you selected and justify your choice. This should be a half-page max.
- Summarize the tasks you asked your participants to complete. You may want to explain why you selected these tasks. This should also be a max of half a page.
- Provide a half-page summary for each participant. **Do not use their real names**. Instead, give them a number or let them choose a pseudonym.
 - Give a 1-2 sentence introduction to the person (gender, rough age range, work or education context)
 - Summarize what you feel worked for the interface and what did not work.
 - Summarize what the person said they liked and did not like about the interface.
- Provide a half page summary discussion on what you learned from "Look"ing vs "Ask"ing, where these two approaches yielded similar insight, and where they differed.
- Provide a half page overall summary. What, overall, did you learn? Did you find that your observation technique worked? Or not? Would there be anything you would do differently next time?

COMP 3020 Project Milestone 2: Low-Fidelity Prototypes

Now that you have had an opportunity to think a little about your problem, and to both observe and talk to people using a similar system, now is the time to start generating your own ideas. The best way to come up with a good idea is to produce lots of them, so you will start by brainstorming many designs before narrowing down. You will then select your best idea and polish it by creating an interactive paper prototype for all the major components of your system.

This milestone has many parts, some will be physical and must be handed in to your instructor ahead of the deadline, while others are submitted online. Sketches and prototypes should be hand-drawn. If parts of your hand-in get separated (e.g., bits of prototype fall out), you might lose marks, so make sure everything sticks together and there's a way to reidentify what goes where/which group bits belong to.

Part (a): Project Direction

You received a general project direction which has room for variation, and in this assignment you will work toward a more narrow project focus. Take some time to reflect on what you want to focus on with your project. For example, in an online shopping project some groups may focus more on the checkout experience while others may focus more on advanced search. Some questions to consider: what makes it interesting, what makes it valuable, what/who does it support, what niche does it fill, why does it excite you? You should also reflect on the observations from the previous milestone to further support your choice. It's ok if you refined or slightly modified your idea and/or some details since the previous milestone, as long as the idea you propose here builds on something you discovered; take this opportunity to explain (and include this in your report).

Deliverable: A half-page summary describing your project's focus including justification.

Building on your project direction decisions, describe a set of key tasks that users will be able to accomplish using your prototype. Pay very careful attention to scope here as it is very easy to prescribe a set of tasks that require an extensive, complex interface. Come up with 5 unique tasks, with three marked as "primary," and two others as "secondary," to denote your priority focus.

Deliverable: A half-page (max) description of tasks that your users should be able to accomplish using your proposed system.

Part (b): Ideation

Let's start generating ideas, as the best way to get good ideas, is to get LOTS of ideas. Most of them are going to be bad ideas, that is expected, but from bulk you will get a few good ideas.

Each group member should come up with 10 rough sketches each of new interface ideas (on paper), keeping in mind your tasks above. Radical, weird, and outlandish ideas are welcome. You are aiming for variance: the ideas should be very different from one another. Include "obviously" bad ideas as well, as long as they are different!

Deliverable: Include each member's rough sketches as an appendix. These will not be marked but you are required to include them. Include pictures/scans of the sketches in your appendix. If you end up with a bunch of sketches that are essentially variations on the exact same idea, try again, because you did not do it right.

Once everyone completes their own sketches, get the group together and work for at least an hour (probably longer...). Share your ideas, sketch new ones, and bounce off each other to move forward.

Deliverable: Present your group's five favorite ideas. Put a picture of the sketch, and a single paragraph below it, explaining why your group likes it. If you are efficient, you will draft this while you meet.

Part (c): Idea Polishing and Initial Proposal

After you complete Part A, take a few days break (a week, if you have the time). Get together as a group again and pick your favorite idea. This will be tough!! (If you are in a pinch, you can select two).

Re-sketch it neatly. From here on, hand-drawn sketches can be done using software (but everything should still be hand-drawn, i.e., only use pen/pencil tools, no shapes, etc.). Add annotations and/or provide descriptions where appropriate to help us understand what all the pieces are or why components are important.

Deliverable: Present a 1-2-page summary and overview of your idea including your pictures/scans of your polished sketches. Explain how it will work, and what is exciting or new about it.

Part (d): Low-Fidelity Horizontal Prototype

Sketch out all the main screens and navigation for your interface to highlight how users will get around and find things.

- Draw and neatly organize a series of "screens" or pages that provide a horizontal coverage of the website including all important components. Show how a person will get around the interface, for example, such as by using annotations, labels, lines, etc. Hand-drawn is fine, but the drawings should be neat and organized.
Even if your tasks target very specific functionality or parts of a system, consider how those parts fit into the whole website which may have other features, pages, login, etc., that may not be included in your tasks.
- Don't worry about the exact details on the pages, focus more on navigation and organization: how people get around and where they will find things, as well as the user experience. You can populate your prototype with examples or other drawings/"scribbles" to illustrate usage at a high level.

Deliverable: Present a 2-3-page summary and overview of your idea including pictures/scans of your polished sketches. Explain how it will work.

Part (e): Low-Fidelity Vertical Paper Prototype

Now you will start to develop the main interaction component of your interface. Develop an interactive paper prototype that enables a user to complete your primary, and possibly, your secondary tasks.

Developing a working paper prototype can get messy very quickly, with screens, widgets, sticky notes, cutouts, etc., and it can become very difficult to work with. Put energy into organization (e.g., get a binder with plastic bags/sheets, etc.) to support your work.

You will also be required to create and deliver a video of your group members using your paper prototype. Make sure to demonstrate all major functionality and anything clever you implemented. You will not be graded on video production quality, but video must clearly demonstrate the prototype, all relevant "screens" and functions, and your key tasks described earlier, for the grader.

Deliverable: A video of group member(s) using your prototype, to demonstrate how it works. Include a link to a video posted, e.g., on YouTube or other similar service (make the link private).. If you use a minor or self-hosted service, and the link does not work when the grader accesses it, it will not be marked.

Deliverable: A writeup that presents your prototype, explains what it does at a high level, and extols its virtues. You should use annotated photos of the prototype to show the various parts and pieces and highlight how they are improvements over existing systems and/or how they will lead to a successful system. Show off! Use as much space as you want but expect 3-5 pages.

Deliverable: All the pieces of your prototype for potential (but not guaranteed) marker reference, e.g., in a binder, plastic folders, etc.

Part (f): Informal Prototype Evaluation

Get some preliminary feedback on your prototypes from at least 4 people who may use such a system in real life, and summarize their feedback. These can be the same people from the previous milestone, but keep in mind that this may taint their feedback – address this case in your writeup.

Deliverable:

- Provide a half-page summary for each participant. **Don't use their real names.** Instead, give them a number or let them choose a pseudonym.
 - Give a 1-2 sentence introduction to the person (gender, rough age range, work or education context)
 - Summarize what worked for the interface.
 - Summarize what did not work.
- Provide a half page overall summary. What, overall, did you learn?

COMP 3020 Project Milestone 3: High-Fidelity Vertical Prototype

You will implement a working, high-fidelity vertical prototype that allows people to complete the primary tasks outlined in the beginning of Milestone 2, Part E. This builds from your paper prototype in Milestone 2, but your prototype won't necessarily exactly match the paper one – it should evolve based on feedback. Note that major deviations from your previous tasks or previous prototype need to be explained and justified (see below).

You will use client-side web technologies (HTML, CSS, JavaScript, jQuery, etc.). You are free to use additional libraries as long as they are documented and cited. However, be warned: platforms and libraries often enforce a look, feel, and flow: don't let it constrain you. In other words, focus on your design first, and then select technologies that will enable you to achieve it. "I couldn't do that using library X" is not a good justification for having a limited prototype (in terms of either novelty or usefulness).

Note: This is a hard assignment, and requires a great deal of initiative and self-learning. Please check and review the online materials we gave you, and get started early. Use the forums to ask technical questions, and ask for code help, as other students are likely facing similar issues.

Technical requirements:

- Your project must work on the most recent Chrome browser (Windows) without any web server or additional technology required, as this is how the marker will evaluate it. You can assume that the marker will be online, so you can reference on-line libraries and resources.
- Your project should use dynamic web technologies (i.e., through JavaScript) to make changes live (preferably) without having to load a new page.
- Hard-code and fake any real data (e.g., menu items). **Effort put into back-end software engineering, databases, etc., will not translate into marks.** (Hmm... why?)
- Your marker will not read an HTML file or debug your code. Make sure that you code the solution with relative path names (to work on any machine, in any folder), and there is a clear index.html file that the marker will run to get started. Be safe: test on a range of machines before submission.
- Assume the marker is not a computer scientist. They will double-click the index.html file and everything should work. The marker will not install anything. The marker will not start up a server. The marker is grading your system at some undefined point after your submission – if it relies on a server, and the server is offline, you might get penalized or zero!
- Using a single HTML file can greatly simplify your development as it streamlines data sharing between pages. You can use multiple files but be aware that you will need to use a data sharing mechanism such as cookies, browser "local storage", query strings, etc. This is additional learning.
 - o Tip: loading files locally can raise security warnings depending on your browser, OS, and configuration. If you run into this issue, ask on the forums and we will help you set your flags.

****Important**:** This assignment must use 100% client-side technologies to ensure markability. If you are unsure about what this means, ask in the forums before using a package, library, or platform. When you are testing your prototype, if the URL displayed at the top of your browser is pointing to anything but a file link ("[file://](#)"), such as a "localhost://" or "127.0.0.1://," then you are using a local server instance and your assignment will not be marked.

- **We need to emphasize this point.** Your assignment is about freely exploring interaction, layout, UI/UX, etc. ideas. Using platforms can dramatically shape your result (e.g., REACT websites often look similar).

- Use this opportunity to work on low-level web technologies such as CSS, JavaScript, and HTML – they are easier than you think, and learning the fundamentals is useful.

Usability requirements:

- Try to apply all the knowledge learned so far in class. Keep good records as you will report on this.
- Pay special attention to input and error checking. If the person does something unreasonable (like enter a word for a where you're expecting quantity), the system should act appropriately.
- Marks will be given for radical innovations and trying something new, assuming it is grounded in good usability principles.

Deliverable: a single .zip file containing your stand-alone website that the marker can launch simply by clicking on the index.html file. They will not run any runtime or standalone server.

Deliverable: a writeup with the following sections

- *Technology overview.* What did you use, what was your approach, what libraries did you use? Maximum half page.
- *Design deviations and evolutions.* Explain what changed from your paper prototype and explain why you made the change. For example, relate your changes to your user feedback. Technical difficulty can sometimes be a reasonable justification for a change if what you had originally envisioned turn out to be really difficult to implement. Maximum half page.
- *Usability overview.* Use maximum 2 pages, perhaps in list form, to explain what usability guidelines you employed – pictures and references to the prototype can help with clarity. Which principles and/or HCI content did you use when designing your prototype and where? Imagine you are trying to convince someone that your team followed good design practices and that you didn't simply do something you "felt" was good.

COMP 3020 Project Milestone 4: Heuristic Evaluation

In Milestone 3 you produced a high-fidelity vertical prototype. In this milestone, you will evaluate your prototype using a Heuristic Evaluation and write a report that summarizes your findings.

Major Milestone Activities:

You will conduct a heuristic evaluation of your system as outlined in class. Each member of your team will use the heuristics, and individually make their way through the interface, identifying when some aspect of the interface violates one of the heuristics. It is important that this step is conducted independently and that you take good notes.

You will then meet as a team, and again walk through the interface, discussing each of the problems that you all identified. Your goal is to identify major problem areas of your interface through this method, which heuristic(s) have been violated to cause these problems, the severity of the problems, and to make recommendations on how to address them.

If you were not able to produce much of a prototype in MSIII due to time constraints, you might have difficulty completing this milestone. You are welcome to expand your prototype for this milestone. If you choose to do so, please include an appendix that documents the extensions that you made to your prototype (with screenshots).

You will generate a report, so it's recommended for everyone to keep good notes as they go through this exercise. Your report should have the following sections:

- Method - briefly describe your heuristic evaluation method (e.g., number of evaluators and your procedure). Half page max.
- Core issues, sorted by severity (worst ones first).
 - o Use one paragraph up to a half page per issue.
 - o Use screenshots or diagrams to show how the issue is manifest in the project.
 - o Explain why it's a problem.
 - o End with a one-paragraph recommendation of how to fix it, or what to do (e.g., talk to users, etc..) to improve for next time.
- Summary (half page) – would you recommend this system? Or was it a good try, but ultimately not a good idea? What worked, what didn't work? Etc.

Deliverable: a writeup as explained above. 3-5 pages, maximum 7.

Deliverable: an appendix (will not be marked) where you should include the raw notes from each evaluator

A second appendix with screenshots and a short explanation of updates made to the prototype before beginning the heuristic evaluation (if no updates were made, this appendix is not necessary)