

## SI 482 Fall 2018

# Interaction Design Studio

## Professor Michael Nebeling

(with input from Professors Tawanna Dillahunt and Mark Newman)

### Instructional Team

- Professor: Dr. Michael Nebeling ([nebeling@umich.edu](mailto:nebeling@umich.edu)) -- <https://mi2lab.com>
- GSI: Katy Madier ([kmadier@umich.edu](mailto:kmadier@umich.edu))
- IA: Sophie Linn ([sophlinn@umich.edu](mailto:sophlinn@umich.edu))

### Classes

- Lectures: Tuesdays 2:30-4 1255 NQ
- Labs: Thursdays 10-11:30 2255 NQ and 2185 NQ

### Office Hours

- Michael: Thursdays 2-4 4377 NQ -- [take an appointment slot](#)
- Katy: Wednesdays 11:30-12:30 1274 NQ, Fridays 9:30-10:30 1277 NQ

### Summary

In this course, you will learn methods and skills involved in designing and prototyping interactive systems. We will cover the design process from the initial formulation of a design problem to creation of digital prototypes. This is a studio course centered around a course project carried out in teams. The class structure is a mix of classroom design activities, lectures, and design critiques of project work by peers and instructors. The project-oriented in-class activities allow you to focus on your project assignments and practice the methods and skills.

### Learning Objectives

After taking this course, you should be able to:

- **follow** a systematic process for designing interactive products, starting from a high-level design problem and ending with a detailed specification
- **create** excellent interaction designs by employing core design concepts and best practices
- **engage** in and respond to constructive critiques of design work as part of a community of designers
- **communicate** design concepts clearly and persuasively at multiple levels of refinement, from concept to sketch to prototype to specification

## Course Schedule

Dates	Lectures / Labs	Assignments Due
4/6 Sep	<b>Week 1: Intro to Interaction Design + CHI Student Design Competition</b>	<b>Initial Survey</b>
11/13 Sep	<b>Week 2: Design Problems &amp; Design Critiques</b>	<b>Initial Survey</b> <b>Short Statement + Bio</b> Weeks 1 & 2 readings
18/20 Sep	<b>Week 3: Core Concepts of Design</b>	<b>Design Problem Statement v1</b> Week 3 readings, Zipcrits
25/27 Sep	<b>Week 4: Personas &amp; Scenarios</b>	<b>Design Problem Statement v2</b> <b>Competitive Analysis</b> Week 4 readings, Zipcrits
2/4 Oct	<b>Week 5: Sketching &amp; Storyboarding</b>	<b>Personas &amp; Scenarios</b> Week 5 readings, Zipcrits
9/11 Oct	<b>Week 6: Wireframing &amp; Design Synthesis</b> Michael away on 11 Oct	<b>Sketching Alternatives</b> <b>Storyboards</b> Week 6 readings, Zipcrits
16/18 Oct	<i>Fall break (no lecture)</i> Michael away on 18 Oct	
23/25 Oct	<b>Week 8: Paper Prototyping+Testing</b>	<b>Design Space Analysis</b> Week 8 readings, Zipcrits
30 Oct/ 1 Nov	<b>Week 9: The Many Faces of Interaction Design</b>	<b>Paper Prototype</b> Week 9 readings, Zipcrits
6/8 Nov	<b>Week 10: Digital Prototyping + Selected Tools Presentations</b>	<b>Paper Prototype Defects</b> Week 10 readings, Zipcrits
13/15 Nov	<b>Week 11: User Interface Engineering</b>	<b>Digital Prototype v1</b> Week 11 readings, Zipcrits
20/22 Nov	<b>Week 12: Evaluating Interface Designs</b> <b>Final Presentation Instructions</b> <i>Thanksgiving recess (no labs)</i>	<b>Digital Prototype v2</b> Week 12 readings, Zipcrits
27/29 Nov	<b>Week 13: Advanced Interaction Design Techniques</b>	<b>Week 13 readings, Zipcrits</b>
4/6 Dec	<b>Week 14: Final Project Presentations</b>	<b>Poster + Final Presentation</b>
11 Dec	<b>Week 15: Beyond Interaction Design</b>	<b>Final Digital Prototype + Report</b> Zipcrits

## Team Project

The centerpiece of this course is a design project that you will develop collaboratively in teams of 4-5 students, over the course of the semester, from the conception of the problem you want to solve, through design research and ideation, to the stage of a digital prototype. Along the way, you will create a number of artifacts that represent different stages of the design process (sketches, personas, low-fi prototypes, etc.). We will use the class activities, labs and homework to move the projects forward. The project for this class is an inclusive design project carried out in teams. We take a very broad view on inclusive design, aligned with CHI's Student Design Competition. The idea is for you to focus on a problem you really care about—whether because it connects to your research interests or it is an aspect of your personal life—and then get the experience of going through the steps of systematically developing a solution to that problem. A side effect of this setup is that, at the end of the semester, you will have a body of your own design work that you can use in your portfolio or as a starting point for developing the project further.

This semester uses the CHI Design Student Challenge both as a framework and a prompt to help you generate ideas for your team project. **Important:** The goal is not to actually participate in the challenge; this is out of scope for this course. Rather, the goal is that, at the completion of this course, you will have all the basic skills and tools, and will thus be ready to compete in such a design competition in the future!

The complete CHI Student Design Challenge call for participation can be found here: <https://chi2019.acm.org/authors/student-design-competition/>. Below we provide an excerpt with the parts that are most relevant to the goals of this course.

### CHI 2019 Design Brief: Weaving the Threads within the Social Fabric

Technology has provided numerous means through which people can connect and create new networks, practices, and cultures. It has also provided new channels for people to make their voices heard and shape the future. We have seen this phenomenon accelerate over the last decade; in societies with serious political crises, local people have been able to communicate with the world and influence opinion and politics. Social technologies, crowdsourcing platforms, and digital fabrication have created new opportunities for invention, business, and manufacturing to be democratized and sharing economies to emerge. Technologies enable different communities of interest or practice to come together to share experiences, support one another, and to address some of the wicked problems faced by humanity.

The theme of CHI 2019 is 'Weaving the threads'. In the Student Design Competition, we encourage you to contribute to this theme by considering the ways that technology might be used to strengthen our social fabric. Social fabric is a metaphor for how individuals interact with each other within a community. Frequent and positive interactions create a tight weave

to create a strong 'social fabric' that can withstand the weight of a challenge. The looser the connections a community has, the looser the weave and the greater the likelihood that the fabric will break. The fabric can also fray if key threads are lost, or develop loose threads if some members of the society choose a different path (e.g. differing opinions on key politics, criminal actions). We challenge you to consider how technology can enhance how people weave together within communities and wider society as a whole.

The scope of this brief is broad: for example, you could focus on healthcare, ageing, education, policy, public service, business development, charity, sustainable living, food, energy consumption, art, or indigenous culture, just to name a few. You can either work with an existing community, or you could aim to create a new community. The scale and definition of a community can vary depending on your design aim, for example, people in the same region, a group of people with the same interests, a network of people who pursue new social or economic value, communities of practice in professional fields and so on. You may adopt design strategies that allow community engagement, including participatory design, co-creation and co-design, service design, design for social innovation, inclusive design and open innovation. You may come up with a participatory design and co-creation approach using existing technologies or you may find opportunity in contemporary developments in technology, such as 3D printing, digital fabrication, citizen sensing, the maker movement, the sharing economy, big data, social networks, IoT, gamification, new sensors and actuators, and Augmented Reality, to name just a few.

Remember, though, that sometimes the best interventions may flow from a simple yet sharp insight gleaned from research, and might require only minimal technology – what is important is that your choice of technology and design intervention should be appropriate for the particular community and context you are focusing on.

For this year's design challenge, we particularly encourage that the following criteria be considered:

- Does the design intervention address a real population and/or situation?
- Does the intervention use technology in an appropriate and novel way?
- Was relevant prior work properly identified and cited?
- Were analysis, synthesis, design and evaluation both systematic and sufficient?
- Was the intervention developed far enough to demonstrate the key ideas?
- Were genuine stakeholders involved in the process of research, development and evaluation?
- Were the research process and the involvement of stakeholders ethically appropriate (e.g., were institutional guidelines followed)? Please note that we will check submissions to ensure that ethics has been mentioned, and we will look for confirmation that appropriate ethical approvals have been gained where necessary (e.g. if working with children or vulnerable communities).

- Did the team explore the entire ecosystem of stakeholders, conditions, and contexts? Was the intervention well-crafted and effectively presented?

**Scoping:** This design challenge is very broad, and that's good because it will enable you to engage in diverse projects that are of interest to you. However, this also means that there is a danger to overshoot and you could choose too big a project, which could make it infeasible in the context of this course. The instructors will help you define an appropriate scope of your project for this course. It is okay to think big initially, but it is necessary to set the right focus and drop ideas that have the danger of being too grand, and we are here to help.

One way to think about scoping is in terms of the number of steps or interactions that your system will support. Think about the process of shopping on Amazon. You first search, then the results page appears, then you click on a result to see the details for that item, then you add the item to cart, then you click to check out, etc. Each of these steps—entering a search term, clicking on a result, adding an item to cart—is a user interaction. Some of these interactions happen on the same page (e.g., adding to cart and clicking the Check Out button both happen on the item details page), while other interactions move the user to a new page (clicking on an item in the results list open the page with the detailed information for that item).

For your project, you should aim to prototype between **15 and 30 user interactions** (steps through the system) that take place across **5 to 10 panels** (e.g., web pages, screens of a mobile application). Most of the panels should be unique.

**Final note:** this is an *interaction design* class, which means that we are focusing on the front-end or user-facing aspects of technology: web pages, mobile apps, the control interface for home automation systems, etc. There are a lot of interesting problems which have a user-experience component, but which are ultimately not front-end problems. For instance, the order in which Yelp or Amazon results appear is fundamental to the user experience of these systems and is something these companies spend a lot of time thinking about and working on. However, determining the results order would not be a good project for this class since this is an algorithmic problem, not a user interaction problem. Pick a project that lets you develop a set of interesting user interactions, not something that is fundamentally about under-the-hood machinery.

## Grading

You should do good work in this class because you care about the project you pick and because you want to learn how to design interactive systems. That said, we must adhere to university policy and use grades, so here is how grades will work in this class:

- **In-class participation: 15 points**
  - **Initial survey: 1 point**
  - **Group work & critiques: 10 points**

- Attendance: 4 points
- Reading responses: 10 points
- Zipcrits: 5 points
- Project: 70 points
  - Project assignments: 30 points
    - Homework: 20 points
    - Poster + Demo: 10 points
  - Paper prototype: 10 points
  - Digital prototype: 10 points
  - Final digital prototype & project report: 20 points

**Final Grades will be assigned per the following scale:**

<b>A+</b>	<b>98-100%</b>
<b>A</b>	<b>94-97%</b>
<b>A-</b>	<b>90-93%</b>
<b>B+</b>	<b>88-89%</b>
<b>B</b>	<b>84-87%</b>
<b>B-</b>	<b>80-83%</b>
<b>C+</b>	<b>77-79%</b>
<b>C</b>	<b>73-77%</b>
<b>C-</b>	<b>70-72%</b>
<b>D</b>	<b>60-69%</b>
<b>F</b>	<b>below 60%</b>

### **Late Assignments**

Many of our classroom activities will involve getting feedback from your peers and the instructors on the work you did for your homework. For this reason, it is important that you finish your homework in time and come to class prepared to discuss it. To encourage timely completion of assignments—and, thus, your ability to fully participate in the class—late homework assignments (those valued at 3 points each) will be penalized 1 point per 24-hour period. Unexcused reading responses and Zipcrits will not be accepted. Unexcused late assignments will only exist under very special circumstances and with prior arrangement with the instructors.

### **Attendance**

Your in-class group activities and class participation grade both rely on you being in class. We will do individual and group activities in class each week. In particular, the labs are crucial to the success of your team project. You are responsible for finding out what you missed in class by referring to the syllabus and your classmates.

## **Accommodation for Students with Disabilities**

If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Services for Students with Disabilities (SSD) office to help us determine appropriate academic accommodations. SSD (734-763-3000; <http://ssd.umich.edu>) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.

## **Student Mental Health and Wellbeing**

The University of Michigan is committed to advancing the mental health and wellbeing of its students, while acknowledging that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression, directly impacts students' academic performance. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) at (734) 764-8312 and <https://caps.umich.edu/> during and after hours, on weekends and holidays or through its counselors physically located in schools on both North and Central Campus. You may also consult University Health Service (UHS) at (732) 764-8320 and <https://www.uhs.umich.edu/mentalhealthsvcs>, or for alcohol or drug concerns, see [www.uhs.umich.edu/aadresources](http://www.uhs.umich.edu/aadresources). For a more comprehensive listing of the broad range of mental health services available on campus, please visit: <http://umich.edu/~mhealth/>.

## **Academic Integrity**

*Abridged version:* Unless otherwise specified in an assignment all submitted work must be your own, original work. Any excerpts, statements, or phrases from the work of others must be clearly identified as a quotation, and a proper citation provided. Any violation of the School's policy on Academic and Professional Integrity (stated in the Master's and Doctoral Student Handbooks) will result in serious penalties, which might range from failing an assignment, to failing a course, to being expelled from the program. Violations of academic and professional integrity will be reported to UMSI Student Affairs. Consequences impacting assignment or course grades are determined by the faculty instructor; additional sanctions may be imposed by the assistant dean for academic and student affairs.

*Collaboration:* UMSI strongly encourages collaboration while working on some assignments, such as homework problems and interpreting reading assignments as a general practice. Active learning is effective. Collaboration with other students in the course will be especially valuable in summarizing the reading materials and picking out the key concepts. You must, however, write your homework submission on your own, in your own words, before turning it in. If you worked with someone on the homework before writing it, you must list any and all collaborators on your written submission. Each course and each instructor may place restrictions on

collaboration for any or all assignments. Read the instructions carefully and request clarification about collaboration when in doubt. Collaboration is almost always forbidden for take-home and in-class exams.

*Plagiarism:* All written submissions must be your own, original work. Original work for narrative questions is not mere paraphrasing of someone else's completed answer: you must not share written answers with each other at all. At most, you should be working from notes you took while participating in a study session. Largely duplicate copies of the same assignment will receive an equal division of the total point score from the one piece of work.

You may incorporate selected excerpts, statements or phrases from publications by other authors, but they must be clearly marked as quotations and must be attributed. If you build on the ideas of prior authors, you must cite their work. You may obtain copy editing assistance, and you may discuss your ideas with others, but all substantive writing and ideas must be your own, or be explicitly attributed to another. See the (Doctoral, MSI, MHI, or BSI) student handbooks available on the UMSI intranet for the definition of plagiarism, resources to help you avoid it, and the consequences for intentional or unintentional plagiarism.

## **Detailed Course Schedule**

### Week 1: Intro to Interaction Design

#### **Recommended Readings:**

“Chapter 1: What is interaction design?” in Saffer, D. (2010). *Designing for interaction: Creating innovative applications and devices* (2nd ed.). Berkeley, CA: New Riders.

#### **Homework due this week:**

*Initial survey:* This survey will help us collect info on your background and interests, and give us a potential direction for your course project.

## Week 2: Design Problems & Design Critiques

### **Required Reading Responses due this week:**

“Chapter 3: Design Strategy” in Saffer, D. (2010). *Designing for interaction: Creating innovative applications and devices* (2nd ed.). Berkeley, CA: New Riders.

Tanner Christensen’s Four Things Working at Facebook Has Taught Me About Design Critique:  
<https://medium.com/facebook-design/critique-is-an-important-part-of-any-design-process-when-you-work-as-part-of-a-team-or-solo-ef3dcb299ce3>

### **Recommended Readings:**

Spool, J. (2012) Goods, Bads, and Dailies: Lessons for Conducting Great Critiques  
[https://www.uie.com/articles/great\\_critiques/](https://www.uie.com/articles/great_critiques/)

Design Critique and the Creative Process:  
<http://www.alistapart.com/articles/design-criticism-creative-process/>

Scott Berkun’s How to Run a Design Critique:  
<http://scottberkun.com/essays/23-how-to-run-a-design-critique/>

“Chapter 1” in Kolko, J. (2011). *Thoughts on Interaction Design* (2nd ed.) Burlington, MA: Morgan Kaufmann (pg. 20 - 39)

### **Homework due this week:**

*Short Biographical Statement:* Add a one paragraph biography of yourself to the course forum. Include your prior education, work experience if you have it, and your background in interaction design if you have any. You could include particular skills you have or any software tools you know how to use related to design, prototyping, etc. If you have developed any kind of interactive system before, please note that, too. *Also, include a statement of what you hope to gain from taking this course.*

*Project Design Problem Statement:* Submit a brief (1/2 page) problem statement for the project you would like to undertake with your team. Start by explaining what the problem is and how it is an interaction design problem. You also need to identify the users and different groups of users that you might need to support differently to address the problem. Specify particular activities that are important to individuals in the target domain. Describe what you believe is done currently to support this activity, what works well and doesn’t work well about that current practice. Finally, think about what the essential functions are that a tool would need to have that would, from your perspective, support this activity in a robust way. Your goal is to consider the human and social nature of the problem and what existing designs lack in addressing the problem. This is intended to be the beginning of a conversation about your project, not the end, so think through the problems that you find interesting and challenging, but remain open-minded to possible changes of direction.

**Important:** You will brainstorm ideas as a team during the discussion sections, and yes this is a team project. But it is important that you frame the problem in your own words. The main goal is for you to learn how to articulate the problem space, and specify the constraints and opportunities that you will consider when carrying out the design process. This assignment will also provide a good basis for discussion with your teammates next week.

## Week 3: Core Concepts of Design

### **Required Reading Responses due this week:**

"Chapter 7: Refinement" in Saffer, D. (2010). *Designing for interaction: Creating innovative applications and devices* (2nd ed.). Berkeley, CA: New Riders.

### **Recommended Readings:**

Norman, D. (2002) *The design of everyday things*. Chapter 4 (p 81 - 104); Chapter 7 (p 187-206).

Jeff Johnson, "Designing with the Mind in Mind": Simple Guide to Understanding User Interface Design Rules. Ch 1-4 (Short)

Lidwell et al "Universal principles of design" (login via Mirlyn for full access): suggested sections are Affordance, Accessibility, Archetypes, Constraints, Consistency, Form follows Function, Flexibility-Usability Tradeoff, Hick's Law, Ockham's Razor.

Homework due this week:

*Individual Design Problem Statement:* Submit a brief (1/2 page, in PDF format) problem statement for the project you would like to undertake. Specify particular activities that are important to individuals in the target domain. Describe what you believe is done currently to support this activity, what works well and doesn't work well about that current practice. Finally, think about what the essential functions are that a tool would need to have that would, from your perspective, support this activity in a robust way. Your goal is to consider the human and social nature of the problem and what existing designs lack in addressing the problem. This is intended to be the beginning of a conversation about your project, not the end, so think through the problems that you find interesting and challenging, but remain open-minded to possible changes of direction.

Important: This is still an individual assignment that needs to be completed by every student enrolled in this class. Yes, you will brainstorm ideas as a team during the discussion sections, and yes this is a team project. But it is important that you frame the problem in your own words. The main goal is for you to learn how to articulate the problem space, and specify the constraints and opportunities that you will consider when carrying out the design process. This assignment will also provide a good basis for discussion with your teammates next week.

## Week 4: Personas & Scenarios

### **Required Reading Responses due this week:**

Alan Cooper's About Face 3: The Essentials of Interaction Design. "Chapter 5 – Modeling Users: Personas and Goals" & "Chapter 6 – The Foundations of Design: Scenarios and Requirements"

Carroll, J. M. (1999). Five reasons for scenario-based design. In *Proceedings of the 32nd annual hawaii international conference on system sciences - 1999* (pp. 1-11).

### **Recommended Readings:**

Dev Patnaik and Robert Becker, Needfinding: The Why and How of Uncovering People's Needs. In *Design Management Journal* (1999).

Shlomo Goltz, "A Closer Look At Personas: What They Are And How They Work", Smashing Magazine. <https://www.smashingmagazine.com/2014/08/a-closer-look-at-personas-part-1/>

### **Homework due this week:**

This assignment has two parts:

1. A 1-page team design problem statement that may integrate ideas from the individual submissions from last week, or may be a new one the team came up with together;
2. a 1-page write-up of your team's competitive analysis.

Only 1 submission per team is required. Submit the assignments as separate pages in PDF or as 2 separate PDF files.

### **Design Problem Statement**

Work together as a team to put together a consolidated design problem statement. It should describe the one problem that you will be working on during the semester. Keep in mind that the framing around this problem as well as any solutions you had in mind so far are still moving targets. The text can be a combination of some of your previous submissions. Unlike last week's assignment, it does not need to be completely original.

### **Competitive Analysis**

Regardless of the particular problem/context you are focusing your project around, it is likely that someone has attempted a prior design in response to a similar issue.

For this assignment, take a critical look at existing systems within your context and articulate what their deficiencies are in respect to supporting your target activity. By systems, we mean not only existing web sites and mobile apps, but any kind of existing solutions (e.g., manual solution, non-digital solution, community-based solution) that (partly) addresses the problem

you are dealing with in your design project. In industry, this is called “competitive analysis” and in academia “related work.” As you research these systems, compile a list of problems or frustrating aspects of the current solutions to your problem. This list (Bill Buxton, a very well-known user interface researcher at Microsoft, calls such a list a “bug list”) can be a starting point for your thinking of how your own solution can do things better.

You have already started with the analysis with your team in the lab, and you may divide the workload by having each team member focus on a different existing solution in their write-up. However, the 1-page submission should be a coherent description of the problem design space and clearly mention the different kinds of competitors that you have identified (between 5 and 7 is a good number). Remember: one of the competitors must be analogous. You should pick this one not because it solves or partially solves your problem and is in your problem domain. No, you should pick it because it inspires you from an interaction design perspective. Like in the Zipcrits, explain what is good about this one and how you will attempt to apply the principles in your project. Finally, your submission should also include a statement that summarizes your reflection on the competitive analysis as a team activity, and what you have learned from it.

### **Rubric**

Five factors that your solution needs to support to address the problem	0.5 pts
At least two competitors, one direct and one analogous that inspires you	1.0 pts
Main pros and cons of each solution and why you picked it	0.5 pts
Lessons learned from doing the competitive analysis as an important step in the interaction design process	0.5 pts
Updated team project design problem statement	0.5 pts

## Week 5: Sketching & Storyboarding

### **Required Reading Responses due this week:**

"Sections 3.2 - 3.4" in Greenberg et al. (2012). *Sketching User Experiences: The Workbook*. Waltham, MA: Morgan-Kaufman.

"Section 4.4: The Narrative Storyboard" in Greenberg et al. (2012). *Sketching User Experiences: The Workbook*. Waltham, MA: Morgan-Kaufman.

### **Recommended Readings:**

Buxton, B. (2007) "The anatomy of sketching" in *Sketching user experiences*. New York: Morgan Kaufmann.

"Chapter 4: The perfect brainstorm" in Kelley, T., & Littman, J. (2001). *The art of innovation: Lessons in creativity from IDEO, America's leading design firm*. New York: Currency/Doubleday.

Suzanne Ginsburg's, *Designing the iPhone User Experience: A User-Centered Approach to Sketching and Prototyping iPhone Apps*. Part Three: Developing Your App Concept, Chapter 6: Exploring App Concepts

Dan Brown, "Developing Web Site Documentation for Design and Planning": Chapter 7: Wireframes:

<http://proquest.safaribooksonline.com/book/web-design-and-development/9780131385399/design-diagrams/ch07>

### **Homework due this week:**

This week the assignment is per team. For your team, submit a joint write-up, (PowerPoint) slides, or (readable) sketch of the following:

*Personas*: Develop 3 to 5 personas of sample users for your design. These may be chosen to be particularly emblematic of the audience(s) you are targeting. To make them as useful as possible, consider maximizing the diversity of characteristics amongst the personas you develop, such that they are illustrative of a wide range of user needs, motivations, skill levels, etc. It is okay to include one negative persona, but focus on primary and secondary personas for this assignment.

*Scenario*: Pick 2-3 personas (at least 1 primary) and, for each of them, put together an interaction scenario (up to 1 page per scenario) along a set of goals/tasks that they should be able to accomplish with your system.

## Rubric

You developed 3-5 diverse personas and detailed each of them so that the differences between them are clear (0.5 points per persona, 3 personas are enough if obviously different).	1.5 pts
You presented 2-3 scenarios and for each described an interaction scenario consisting of the typical elements, namely setting, agent(s), goals, actions, and events (0.5 per scenario, 2 scenarios are enough if all elements are included).	1.0 pts
Personal reflection on the process of designing personas and scenarios	0.5 pts

## Week 6: Wireframing & Design Synthesis

### **Required Reading Responses due this week:**

"Chapter 5: Structured Findings" in Saffer, D. (2010). *Designing for interaction: Creating innovative applications and devices* (2nd ed.). Berkeley, CA: New Riders.

MacLean, A., Young, R. M., Bellotti, V. M. E., & Moran, T. P. (1991). Questions, options, and criteria: Elements of design space analysis. *Human-Computer Interaction*, 6(3-4), 201-220. (through section 2)

### **Homework due this week:**

#### **Submit one combined PDF for the team that includes:**

1. **The team's 2 storyboards**
2. **Each team member's individual sketches (photo, scan). Individual sketches for every student have to be labeled with that student's name**

Only one submission per team is required.

*Individual Sketches:* Take a 11"x17" piece of white paper and divide this paper into 40 2"x2" squares. **Use the space to sketch solutions to your design problem, one in each square, writing a brief caption for each** to help someone else understand the idea each sketch conveys. Together, the sketches should cover the two scenarios (setting, user, goals, actions/events), and you should explore different ideas and illustrate these through a variety of sketches.

#### **A few important guidelines:**

- Focus on quantity not quality
- No two ideas should be alike
- Include ideas from existing products or prior research
- Every caption should include an active verb, conveying what the solution does to address the problem.
- If you get stuck, think about different contexts in which your system could be used to inspire new ideas.

#### **Each team member creates their own individual 40 sketches and adds a picture/scan to the combined team PDF**

#### *Team Storyboards:*

Come back to your scenarios from last week (focus on 2 scenarios if you did 3). The goal is to produce one storyboard for each scenario (so 2 in total per team). Now, pick

your favorite sketches from all team members (or sketch the missing pieces) and organize them into **2 storyboards that provide a visual narrative of your scenarios** (aka “narrative storyboard”). Please add annotations to help someone else see how the user's task would progress in response to their interactions.

**All team members jointly create the 2 storyboards. One team member submits the 2 team storyboards, along with all the individual sketches on behalf of all team members.**

### Rubric

40 labeled sketches for every team member (every caption should include an active verb, conveying what the solution does to address the problem)	1.0 pts
Diversity in ideas (don't just sketch one idea in varying detail, but multiple ideas)	1.0 pts
2 annotated storyboards that connect back to the scenarios from last week (and cover main features from competitive analysis)	1.0 pts

## Week 8: Paper Prototyping+Testing

### **Required Reading Responses due this week:**

Rettig, M. (1994). Prototyping for tiny fingers. *Communications of the ACM*, 37(4), 21-27.

"Sections 3.7: Sketching with Office Supplies" & "3.8: Templates" in Greenberg et al. (2012). *Sketching User Experiences: The Workbook*. Waltham, MA: Morgan-Kaufman.

### **Recommended Readings:**

Moggridge, B. (2007) "Prototypes." In *Designing Interactions*. Cambridge, MA: The M.I.T. Press, pp. 682-723.

### **Homework due this week:**

Submit a design space analysis in QOC notation with wireframes and design rationale for each per team.

*Design Space Analysis:* Review your design project's results, including your competitive analysis, sketches, scenarios and storyboards. Following the QOC approach, work through the design considerations for one critical feature of your project. Produce a Design Space Analysis comprised of 3 QOC's, consider the tradeoffs between different options, highlight the preferred option you would adopt, and explain the rationale for adopting it.

*Wireframes:* Make sure that you sketch each option (can be based on your previous assignments) and put the options in context by creating wireframes as part of your design synthesis.

Each team jointly submits one document containing your QOCs, wireframes, and design rationale. That is, for each of the three QOCs, include a paragraph summarizing the question and your design rationale for adopting the option you picked based on the set of criteria you laid out. Again, make sure that you illustrate the options in context with wireframes.

### **Rubric**

You developed 3 QOCs that relate to one critical feature of your design project	1.2 pts
For each QOC, you provided a strong design rationale for adopting the option that you highlighted in the respective QOC	0.8 pts

You sketched each QOC option and put the options in context by creating wireframes	1.0 pts
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## Week 9: Final Paper Prototyping

### **Required Readings:**

Rudd, J., Stern, K., & Isensee, S. (1996). Low vs. High-fidelity prototyping debate. *Interactions*, 3(1), 76-85.

### **Optional Readings:**

Buxton, B. (2010). Chameleon: From Wizardry to Smoke and Mirrors. From *Sketching User Experiences: Getting the Design Right and the Right Design*.

Hummels, C., Overbeeke, K.C.J. & Klooster, S.(2007). Move to get moved: a search for methods, tools and knowledge to design for expressive and rich movement-based interaction. *PUC* 11:677. doi:10.1007/s00779-006-0135-y  
<http://link.springer.com/article/10.1007/s00779-006-0135-y/fulltext.html>

### **Homework due this week:**

Submit one paper prototype, report, and video per team.

*Paper Prototype:* Using paper, sticky notes, scissors, tape, and any other supplies you may want to use, create a paper prototype of your project solution. Focus on tasks and interactions from the scenarios and storyboards you developed previously. Prototype as many of the interactions you are planning to implement in your final prototype as you can (interactions can be as small as clicking a button to select an item and as large as having an entirely different screen show up, e.g., to search for an item). Try to have a reasonable balance of “bigger” and “smaller” interactions. We want to see a rich and diverse set of interactions in your prototypes.

**Note on scoping:** For your project, you should aim to prototype between 15 and 30 user interactions (steps through the system) that take place across 5 to 10 panels (e.g., web pages, screens of a mobile application). Most of the panels should be unique.

To make this exercise as useful to you as possible, make sure to prototype all the interactions about which you are uncertain and for which you want feedback from your peers and instructors.

*Report:* Write a 1-page report on the design decisions your team made, what did or did not work well in the process, and what you might want to do differently.

*Video:* Create a short video illustrating your paper prototypes in action (using a phone camera is perfectly fine).

### **Rubric**

Paper prototype supporting 15-30 user interactions taking place across 5-10 panels	1.5 pts
Video showing the possible interactions supported by the paper prototype	1.0 pts

1-page report documenting at least 2 design decisions and 1-2 possible improvements

0.5  
pts

## Week 10: Digital Prototyping II

### **Required Readings:**

*Chapter 5: Picking the Right Tool* in Warfel, T. Z. (2009). *Prototyping: A Practitioner's Guide*. Brooklyn, NY: Rosenfeld Media.

### **Recommended Readings:**

Also skim *Chapters 6 - 11* in Warfel, T. Z. (2009). *Prototyping: A Practitioner's Guide*. Brooklyn, NY: Rosenfeld Media.

GUI Prototyping Tools: <http://c2.com/cgi/wiki?GuiPrototypingTools>

### **Homework due this week:**

Finish your paper prototype, conduct several tests with members from other teams and fill in a usability inspection log for each test. Submit all logs together with a 1-page report on your tests including an analysis of the defects.

*Final Paper Prototype:* In general, your goal with the paper prototypes should be to give us a good idea of what you are hoping to develop as your final prototype. Make sure that your final paper prototypes are sufficiently complex, i.e., they support 15-30 interactions across 5-10 unique panels and support the 2-3 scenarios you developed earlier (ideally the scenarios have evolved, and that's great!).

*Paper Prototype Defects:* Describe and analyze the defects found in the paper prototype testing session. In your report, also include how you would, or actually did, fix the issues found by users. If you made changes to your paper prototype, include digital copies of those as well.

### **Rubric**

Submit 3 usability defect logs from your paper prototype tests	1.5 pts
Submit a 1-page report of your paper prototype tests including your analysis of defects	1.5 pts

## Week 11: Digital Prototyping II

### **Readings:**

We don't have any required readings assigned for Week 10. However, we're looking for reading suggestions for Week 11. Our preference would be some kind of reflection from a practitioner who has significant experience doing interaction design and discusses issues and things to pay attention to based on their experience. We have an article in mind, but thought we would try to crowdsource this as much as possible by soliciting your input.

For example, something along the lines of Scott Berkun's "[The Human Factor in User Interface Design](#)" who had a couple of articles published in the early 2000s while at Microsoft would be good.

So, if you came across "*something interaction design project reflection*" that inspired you and that you would have liked to share with others ([Smashing Magazine](#), [A List Apart](#), [UX Matters](#), [Medium](#), [UX Magazine](#), [uxdesign.cc](#), [UXBooth](#), etc.), please add it under this week's reading discussion together with a short summary and explanation why someone should read it.

Up to 1 point of extra credit will be given for a recommended reading suggestion.

### **Homework due this week:**

This is the first step in the process of creating your digital prototype.

*Pick your digital tool(s):* To begin, figure out what digital tools you want to design your prototype in and start to translate your prototype so far (i.e., your sketches, storyboards, and paper prototype) into an interactive prototype. Allowing you to select a tool of your choice means you can learn a tool that you think is relevant to your project, works for your team, and may add an important skill to your resume. However, giving you the choice also means that we may not know your tool(s), and thus may only be able to help to some extent. But chances are someone else in the course knows the tool, and maybe you could consult with them.

Submit a 1/2-page rationale for choosing the tool(s) for your project (could be based on specific features of the tool, popularity, compatibility, etc.).

*Create first version of your digital prototype:* As the first step, we are looking for digital mockups of the various panels of your paper prototype and initial support for interactions. Your final digital prototype should have at least 15 interactions, where an interaction is defined as having a trigger (e.g. click, button) cause an event (e.g. new screen). Your digital prototype should look polished and visually appealing, but the focus is on the interactions. It should look like something that you would be excited to show a client, or colleague, or boss.

Possible submission formats:

1. Screenshots (if you just have mockups)
2. Video (if you have interactive prototype) for initial feedback. For video, MP4 format or YouTube video link; screen capture preferred, but using a phone camera is perfectly fine.
3. Link to a hosted digital prototype online (e.g. link to an InVision prototype) and document with instructions on how to use it (if applicable).

*Develop plan to completion:* There will still be lots to do, and you need to distribute the work. It is crucial to develop a plan of who is responsible for which parts of digital prototype.

Submit a 1/2-page plan that describes what you want to achieve by 17 Nov (Version 2), 1 Dec (Poster + Final Presentation; consider that there is the Thanksgiving break in between), and 8 Dec (Final Digital Prototype + Report).

### **Rubric**

1/2-page rationale for selected digital prototyping tool(s)	0.5 pts
1/2-page plan for who is responsible for what over the next few weeks	0.5 pts
Screenshots, and/or video, and/or link to hosted digital prototype of first version of digital prototype (most important panels and basic interactions illustrating user flow)	2 pts

## Week 12: Evaluating Interface Designs + Final Presentation Instructions

### **Readings:**

None.

### **Homework due this week**

For this assignment, complete the following tasks:

1. Submit your Digital Prototype V2
2. Submit a 1-page report on the usability inspection session

#### *Digital Prototype V2*

Possible submission formats:

1. Video (if you have interactive prototype) for initial feedback. For video, MP4 format or YouTube video link; screen capture preferred, but using a phone camera is perfectly fine.
2. Link to a hosted digital prototype online (e.g. link to an InVision prototype) and document with instructions on how to use it (if applicable).

#### *Report*

List the changes that you are making to your digital prototype and indicate why you are making them. Take into consideration the feedback you got from your classmates and the instructional team. If you made changes to your digital prototype, include screenshots of those as well.

### **Rubric**

Digital prototype V2 supporting 15-30 user interactions taking place across 5-10 panels	3.0 pts
1-page report documenting what feedback you got from peers and instructors and how you have addressed it.	3.0 pts

## Week 13: Advanced Interaction Design Techniques

- Voice based interfaces
- AR/VR

## Week 14: Final Project Presentations

### **Readings:**

For your last reading response, pick one of the reading suggestions posted by your classmates in [Week 10](#), and write a response, as well as reply to a classmate's response. This is a bonus assignment that will allow you to earn up to 3 extra credits. If you previously missed to submit reading responses, this is your chance to make up for it.

### **Homework due this week:**

For this assignment, complete the following tasks:

3. Create a poster
4. Prepare a demo for your final project presentation

#### *Poster*

The design and the layout of the poster itself is open for creativity. You can refer to posters from past CHI student Design Competition. A poster would normally use the ISO poster size format (A0). However, since we will be showing digital versions of your poster (to make setup and transition between teams hopefully easier), you should design for 16:9 landscape Full HD (1920x1080p) resolution.

Your poster should include the following:

- Your project's name, and the names of all team members.
- In 1-2 sentences, summarize your design statement. Specifically, how does it fit within the "Engaging a Community" CHI design prompt?
- Include 2 aspects of your project that you are most excited about. This can be new interactions, design decisions, design rationale etc. Something that you think is cool about your final project design.
- Up to 4 Screenshots showing the core features/functionality of your digital prototype.
- Apart from this, you can take one of two approaches to present your final project:
  - Process: Talk about the process that you took to come up with your final design. Use illustrations from past assignments and add short descriptions.
  - Kickstarter Project Pitch: Who is your target audience? Why existing solutions don't work well? Why is your solution better than the competitors and how will it change people's lives? How did you get to your final design--the journey.

#### *Demo*

The main purpose of the presentation is to showcase to the class what you have been working on this term. Your presentation should include the following:

- A brief description of what problem you tried to solve in your project and why this problem is important.
- A high-level overview of your solution (e.g., “I created a prototype for a mobile-phone application that enable users to do X, Y, and Z.”)
  - Ideally, you use the poster as reference.
- A walkthrough of one or two key features of your interface. You should prepare this--have a script and rehearse your demo.
  - Ideally, this is based on your scenario(s).
  - Ideally, you give a live demo of your digital prototype. But, as a backup, you can do this with screenshots/slideshow.
- A design rationale for an important design decision you had to make during the project. This is to give us a flavor of the kind of thinking that went into the project.

### Rubric

Poster that summarizes your design statement and illustrates 2 important aspects	3.0 pts
Demo walking through a typical scenario and two key features of your interfac	7.0 pts

## Week 15: Beyond Interaction Design

### **Recommended Readings:**

Emelyn Baker: Building your design portfolio? Here are 8 things I wish I'd known.

<https://medium.com/doing-the-work/it-s-portfolio-season-here-s-8-thing-i-wish-i-d-known-while-designing-mine-4869308540e7>

Patrick Neeman: Here Are The Hard Skills You Need To Succeed As A New Designer

<http://www.usabilitycounts.com/2013/08/13/here-are-the-hard-skills-you-need-to-succeed-as-a-new-designer/>

(Note: this one is a bit negative, but probably true)

### **Homework due this week:**

Submit your final digital prototype and written report of your design project.

*Final Digital Prototype:* Create a video of your final interactive prototype. For video, MP4 format or YouTube video link; screen capture preferred, but using a phone camera is perfectly fine.

*Final Project Report:* Write a project report of 2-3 pages single-spaced, with sketches and screenshots as appendices—these don't count for the page limit. Please don't feel the need to add as many screenshots as you possibly can. Select those that convey useful information. Focus on quality and polish as if you were delivering it to a client. Include a link to your final digital prototype in the report. Consider using, but feel encouraged to adapt, the outline below:

#### 1. Problem Statement

- In 2-3 sentences, summarize your design problem statement. Specifically, how does it fit within the "engaging communities" CHI design prompt?

#### 2. Solution Overview

- Briefly characterize the users and settings you designed for.
- Provide an overview of the basic functionality in terms of tasks such users can perform.

#### 3. Final Design

- Provide a description of the main parts of the design flow. This is important because it will provide you with a record of how the design worked or was intended to work, long after the implementation no longer works. It could in principle also act as a deliverable to hand off to an engineer. You can do this in text wrapped around screenshots, or visually by creating a user flow map that connects screenshots of your mockups to illustrate navigation paths.
- Include 2 aspects of your project that you are most excited about. This can be specific interactions, design decisions, design rationale, etc. Something that you think is cool about your final project design, and makes your project stand out.
- Discuss aspects that you did not implement in your digital prototype, and why?
- Mention the tool(s) and approaches you used to develop the design throughout. This is where you can refer back to assignments that you think shaped your project the most.

- Discuss 2 pros and cons of these approaches and tools for your project. This is where you can include key points from your previous assignment reflections.

#### 4. Design Evolution

- Summarize how your design changed from early sketches and wireframes, to the paper prototype, to the final digital prototype.
- Illustrate 2 major changes and explain why they were made. Include important feedback from instructors and peers that motivated these changes.
- Relate your design process and choices to the readings.

#### 5. Impact

- Discuss the impact that your design could potentially have in your problem domain.