Design Activity, Intro to HCI, Intro to Class
The Challenge

20 sticks of spaghetti + one yard tape + one yard string + one marshmallow
The Challenge

**Goal:**
Build the tallest freestanding structure. The winning team is the one with the tallest structure measured from the table top surface to the top of the marshmallow.

**Rules:**
1. The structure **cannot be suspended** from a higher structure, like a chair, ceiling, light
2. The structure **cannot be taped to the desk/table.**
3. The **entire marshmallow must be on top**—cutting/eating part of the marshmallow is not allowed
4. Use as much or as little of the kit; however, you **cannot use the paper bag** as part of your structure
5. You can **break up the spaghetti, string, or tape** in anyway you want.
6. The challenge lasts **18 minutes.** You **cannot hold/touch the structure after time runs out.** You cannot open the bag until the timer starts.

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**TEAM MEASUREMENTS:**
1. Team: Luka – 26.25
2. Team: Halley – 25
3. Team Victor – 37.5
4. Team Izzy – 15
5. Team Pete – 0
6. Team Alex – 0
7. Team Jason – 19.5
8. Team Jake – 27.25
9. Team Erica – 22.5
10. Team Andrew – 19.5
11. Team Sam – 22
12. Team Eileen – -2

*Red teams had previous Marshmallow challenge experience

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Debrief:
1. How did you approach the task? What was your building process?
2. How did you collaborate and work together?
3. What is the key to a tall structure? Why?
4. What do you think are shared attributes between the most successful teams?
**My Thoughts**

To me, this task represents a microcosm for the entire semester. This course is fundamentally about **design**, which requires creativity, iteration, and collaboration.

It’s also about working with and within constraints—be it time, money, or resources. You cannot escape constraints in life or work.
Peter Skillman’s Takeaways

You learn by doing

Work in parallel

On being first to market

Multiple iterations

All projects have resource constraints

Peter Skillman, Original Marshmallow Challenge Talk
TED, 2006, http://youtu.be/1p5sBzMtB3Q
Learning from the mistakes of others* is the best way to launch an idea.

* or yourself
Multiple iterations almost always beats the single-minded commitment to building your first idea.
Video from http://marshmallowchallenge.com/Welcome.html
Who Consistently Performs Well?
Who Consistently Performs Well?

Video from http://marshmallowchallenge.com/Welcome.html
CMSC434 Fall 2014 Overview

This is the only course in the undergrad computer science catalog with the word human in its title. This is not insignificant. In this course we will reposition ourselves to think about computer science not just in terms of algorithmic performance and technical sophistication but in terms of how technology can be perceived, used, and adopted by people. By placing humans at the center of our design focus rather than technology, our concerns shift in interesting and, hopefully, illuminating ways. For example, there are many ways to design and build a user-facing application—how do we know which path is the right one? What methods and guidelines can we apply to maximize our chances that our design is the most useful, usable, and enjoyable? In this class, you will learn to ideate, critique, prototype, evaluate, design and refine interactions, interfaces and applications for people.

Instructors

Dr. Jon Froehlich
Assistant Professor, Computer Science
jonf@cs.umd.edu
http://www.cs.umd.edu/~jonf
Twitter: @jonfroehlich
CS Office: 3173 AV Williams
HCIL Office: 2117F Hornbake
Office Hours: By appointment
Course Schedule

Generated with the online Gantt chart tool from smartsheet.com
WARNING

High Workload Ahead
“This class is certainly a fun, interesting course to take .. it will keep you quite busy and you can easily fall behind if you don't stay on top of your workload.”

- CMSC434 Student

“Course was actually intensive in terms of workload, but we learned more...”

- CMSC434 Student

“Overall, the course was a lot of work (as you warned us in the beginning of the semester), but I learned a lot. One of the best CS courses I've taken at UMD.”

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"Overall, the course was a lot of work (as you warned us in the beginning of the semester), but I learned a lot. One of the best CS courses I've taken at UMD."
- CMSC434 Student
Workload was appropriate.

- CMSC434 Student
Really appreciated the process of learning how to brainstorm, sketch, plan, and build. Will be useful in many future endeavors...

- CMSC434 Student
I would have prefer a programming unit in this class to show us how we can use today's technologies to connect to what he said in class.

- CMSC434 Student
ASSIGNMENTS & ASSESSMENT

70% of your grade is based on your performance on assignments

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"The professor tries very hard to make the classroom into a friendly, interactive community where every student is engaged in learning from the material, the professor, and each other; and I think he has overwhelmingly succeeded."

-CMSC434 Student
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CMSC434 Group Project
Theme: Mobile
Rule: Must use a sensor as core part of application interaction
**Goal:** Apply and integrate user-centered concepts learned in this class along with your other (current and prior) computer science education.

**Secondary Goal:** Work on real problems! Intense end-to-end design.

**Focus:** Mobile Applications With Sensor Integration

1. You pitch project ideas
2. We will sketch, prototype, test, and iterate.
3. You have to implement the final prototype in code.

**Teams:** Divided up based on skills and interest. If you have a significantly good practical reason for working with someone, let me know.

You must be committed to working with your team throughout the semester.
Human-Centered Design
Iterative Design

- Design
- Build
- Evaluate
TA04: Sketches, Storyboards, & Critiques
TA05: PAPER PROTOTYPING AND USER TESTING

Chats

*Compose*

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Languages

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<td>3:42</td>
<td>I'm good how are you?</td>
</tr>
<tr>
<td>3:45</td>
<td>ole työnt?</td>
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<tr>
<td>3:47</td>
<td>Not yet. Do you want to meet for Lunch?</td>
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<td>varma. Nähdaän pian</td>
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</table>
TA06: MID-FI PROTOTYPES & CRITIQUES
TA07: Final Interactive Prototype

... bringing the world closer together through translated mobile chat
TA09: Final Video

Source: Anand Agrawala, University of Calgary, http://youtu.be/_66uD0AKJjc
Teddy Phidget
by (MC) Anand Agarawala
University of Calgary
The class will vote on the best interactive prototype as well as best final video. The winning team will get an award.
Group Project

FEEDBACK

Design Critiques
I think it'd be good to have a say in what group you'll be in, after indicating your initial topic preferences. I got stuck in a group that is pretty apathetic, and it's come through the most with our final project. I've coded 98% of it, and I can't do anything about it, because we set a mutually agreed schedule for adding code. There's only so many times I can keep asking for contribution when the group members don't care.

Really liked how we reviewed the class' works and that you guys actually handed us these peer reviews back. Definitely a good way to get good feedback.”

- CMSC434 Student
Group Project

**Feedback**

- Design Critiques
- User Testing
- Peer Assessment
I think it'd be good to have a say in what group you'll be in, after indicating your initial topic preferences. I got stuck in a group that is pretty apathetic, and it's come through the most with our final project. I've coded 98% of it, and I can't do anything about it, because we set a mutually agreed schedule for adding code. There's only so many times I can keep asking for contribution when the group members don't care.

- CMSC434 Student
Groups

Peer assessment: your group members will evaluate your effort.

Your grade can be (significantly) higher or lower than the group average.

Take your commitment to your group seriously.

Note: These are private and will not be shared with your teammates
Group Project Feedback

- Design Critiques
- User Testing
- Peer Assessment
- Feedback from TA/Prof
Hall of Fame

Hall of Shame
Hall of Fame/Shame

Every student must submit at least one "Interaction Design Hall of Fame/Shame (HoF/S)" throughout the semester. A HoF/S submission is a video recording of either a user interface design fail or a positive user experience. Whether a Fame or a Shame, your video should clearly articulate what design principles were used (or for Shames, not used or broken). This can be done via a voice-over or clearly marked captions (or both).

Your video should be uploaded to YouTube with a two page paragraph explaining the HoF/S and with a link back to this class http://cmsc434-f14.wikispaces.com/. You should submit the YouTube link along with a copy/paste of the aforementioned description to the HoF/S assignment page via Canvas. You should also tag your video on YouTube, we have one required tag: CMSC434. Note, you do not have to use your own YouTube account to upload the video; you can make a new, anonymous throw-away account for this—it’s up to you.

For video recordings, you can use screen recorder software or any video camera (e.g., your smartphone). A video camera is useful to, for example, record your interactions with ATMs, parking garage ticket machines, etc. For screen recording, I like Quicktime, which has a nice built-in screen recorder (link). On a PC, I like Camtasia Studio (link).
As you watch the following video, think about **why designing such an interactive system is hard** and **why the user struggles**
Touchscreen Soda Fountain
Submitted by: Jon Froehlich
Why is this a hard design problem?

Why did the user struggle?
Facebook Inline Translation
Submitted by: Jon Froehlich
FAME!
Submit your video recording (screen capture or cell phone) along with a paragraph (or two) description of why its Hall of Fame or Hall of Shame. Your description **must include principles** learned from class.
Camtasia Studio

Screen Recording & Video Editing Software

More than a simple screen recorder, Camtasia helps you create professional videos easily. Use Camtasia to record on-screen activity, customize and edit content, add interactive elements, and share your videos with anyone, on nearly any device.

Camtasia Studio for Windows
Latest Software Version: 8.1
Explore Features
Buy Now

Camtasia for Mac
Latest Software Version: 2.4
Explore Features
Buy Now

Capture What You're Seeing and Doing
Record your screen to capture PowerPoint slides, software demos, webpages, and more. You can also import camera video, music, photos, and more to fully customize your screen recordings.

Create Videos with Professional Polish
Edit your screen recordings and camera video with the powerful, yet easy to use, video editor. Enhance your screen recordings and videos with ready-to-use themes, animated backgrounds, graphics, callouts, and more.

Share and Interact with Your Audience
Produce interactive videos with clickable links, tables of contents, search, and more. Then choose from a variety of outputs to easily share videos that your viewers can watch anywhere, on nearly any device.

Camtasia Studio vs. Camtasia for Mac
What's the difference?
Compare the features and functionality of Camtasia Studio and Camtasia for Mac.
View Comparison Chart

Education Pricing
Did you know TechSmith has special pricing and discounts for educators, school districts, colleges, and universities?
Learn More
Buy Now

Camtasia Studio
Free Trial  Buy Now
About audio and movie recording in QuickTime Player

You can make a movie using QuickTime Player and the camera in your Mac by clicking the File menu and choosing New Movie Recording. When the recording interface appears, the FaceTime or iSight camera becomes active (a green light appears by your Mac’s built-in camera). Simply press the circular record button once to start or stop your recording.

Click the triangle icon to display a menu of additional options, such as whether to use your Mac’s built-in camera or an external camera you’ve connected to your Mac, and what the finished quality of your recording should be.

To make an audio-only recording, simply choose New Audio Recording from the File menu. Press the circular record button once to start or stop your recording. You will notice that the current running file size is displayed on the bottom right of the controls while you’re recording; this changes to the total elapsed time when you stop recording. The sound meter (located at the bottom of the controls) makes it easy to ensure your volume level is consistent, and is helpful for making sure you’re sitting an appropriate distance from the microphone. About 21 inches of distance between you and the microphone is a good place to start.

Clicking the triangle gives you additional options, such as letting you choose whether to use the built-in microphone on your Mac, an external microphone you’ve connected to your Mac, a microphone from a connected Apple display, and lets you adjust the finished quality of your recording.

Tip: Changing the quality from High to Maximum will produce a very high-quality uncompressed movie file. However, uncompressed audio files can use large amounts of disk space.

Export audio only using QuickTime Player

QuickTime Player gives you the option of exporting and sharing only the audio portion of your video. To export only the audio portion of your video, open your video in QuickTime Player. Choose Export from the File menu. Type a name in the “Export As” field. Then from the Format pop-up menu, choose “Audio Only” and click Export.

Record your screen

You can use QuickTime Player to make a video recording of your screen or just a region of your screen and save it as a movie file for later viewing. This can be helpful for showing others how to perform a task, workflow, or for training.

Choose File > New Screen Recording. To start recording what’s occurring on your Mac’s screen, click the round record button.

You can record some of all of the screen.

- If you want to record the entire screen, click anywhere on the screen to start recording.
- To record just a smaller portion of the of the screen, drag your pointer to select the region of the screen you want to record, and then click the Start Recording button within the region.
# This Week

## September 2014

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
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<td>IA01 &quot;About Me&quot; Survey</td>
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<td>R02: Task-Centered Design Process</td>
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<td>Class Starts</td>
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<td>L02: Ideation, Desi</td>
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**Notes:**
- Individual Assignment (IA)
- Group Project Assignment (TA)
- Reading Assignment (R)
- Event/Holiday
- Lecture (L)
Hi CMSC434 students,

This survey is intended to help me better understand your background and goals. Having more information about you, the student, will hopefully improve my ability to teach you and, consequently, improve the overall quality of the course. In addition, I think this survey provides a worthwhile exercise for you to reflect on your own education—whether you are getting what you need and want out of your Computer Science/Computer Engineering education and potential areas for improvement.

Please keep your written responses to a maximum of 3-4 sentences per question.

Thanks! Jon (and Matt)

1. Your name: *

2. Why did you major in Computer Science or Computer Engineering? If you didn't major in CS or CprE, please indicate your major and explain why you selected that field as a course of study. *
R01: BRAINSTORMING

This is due: Thursday by classtime. Fill out your response in Canvas.
http://cmsc434-f14.wikispaces.com/R01+Brainstorming
R01 Brainstorming

Posted: Monday, September 1
Due: Thursday, September 4th, 7AM
Point Total: Reading responses are worth 5% of your total grade.

For this reading response, we have one assigned reading and one assigned video:


2. ABC News Video, *IDEO Design Thinking*, 60 Minutes, January 2013 [source link](#) (This video is about Tom’s brother David Kelley, who is the founder of IDEO and a professor at Stanford).

These two sources are meant to help you prepare for and approach the IA02 Project Pitch assignment.

Many assigned readings (including this one) will have a response component on Canvas. Each answer should be at most three sentences and can be in bullet-point form. The responses are graded from 1-10. A 10 will be awarded to responses with clear depth of thought, a demonstrated understanding of the reading material, and relevance to the stated questions/provocations. Note: you will be able to see your peer’s responses after you submit. Bear this in mind as you write. Content from all assigned readings/videos will be included in quizzes and the midterm exam.

R01 questions/provocations:

1. What do you think are the two most useful “secrets” for better brainstorming from Tom Kelley’s article?

2. Do you feel like you have to use ideation/brainstorming skills in your other CS classes? Why or why not?

3. How do you plan on applying the recommendations from Tom Kelley’s article on IA02 Project Pitch?

4. What are some keys to “unlocking creativity” at IDEO (from both source 1 and 2)?
Project Pitch

Posted: Sunday, August 31st
Due: Sunday, September 7th, 11:59PM
Point Total: This assignment is worth approximately 4% of your overall grade.

Assignment Overview

In this course, we have two main types of assignments: individual assignments and a semester long project (completed in teams of four). The theme of the semester long project this year is mobile.

Your project pitches must all be mobile applications with one additional stipulation: as a core part of the user interaction, the application must utilize one or more of the mobile device's built-in sensors (e.g. GPS, microphone, accelerometer). The projects can be implemented in either the device's native language (e.g., Objective C for iPhone, Java for Android), HTML5/JavaScript (e.g., read how to access GPS via HTML5), or somewhere in between (e.g., PhoneGap).

Matt and I will review each project pitch and select the top 20-30, which you will vote on in your next assignment (IA03).

This assignment has two parts.

Part One

Brainstorm a list of potential interactive mobile application ideas. This brainstorm can be on paper (preferred) and then scanned in or in your favorite text editor. You must turn in the list. Make sure your ideas are big enough for ~15 weeks and a four person team. Zany and creative ideas are encouraged. Please follow Tom Kelley’s suggestions for the "perfect brainstorm" [link]. You should have around 20 different ideas.

Some examples:

- an interactive visualization of http://data.dc.gov local city data which changes based on your location,
- a new kind of game controller and custom game using Arduino + Tablet [link]
- new kinds of ambient visualizations of air pollutants (e.g., [link])
- new mobile application with routing navigation algorithms and interfaces that provide an accessibility score for individual routes in https://targnav.umd.edu/
- a "fog-of-war" type mobile exploration game that encourages bicyclists to explore new parts of the city (unexplored areas are blacked out and only become visible when you bike through them; gamifying biking).

Part Two

Select two ideas from your list and write-up an “elevator pitch” for each. The elevator pitch itself should be no longer than two paragraphs though one is

Table of Contents

- Project Pitch
  - Assignment Overview
  - Part One
  - Part Two
  - Available Software Tools
    - The Elevator Pitch
    - Example Elevator Pitch
    - Analyzing the Example Pitch
  - Deliverables
Part One

Brainstorm a list of potential interactive mobile application ideas. This brainstorm can be on paper (preferred) and then scanned in or in your favorite text editor. You must turn in the list. Make sure your ideas are big enough for ~15 weeks and a four person team. Zany and creative ideas are encouraged. Please follow Tom Kelley’s suggestions for the “perfect brainstorm” [link]. You should have around 20 different ideas.

Some examples:
- an interactive visualization of [link] local city data which changes based on your location.
- a new kind of game controller and custom game using Arduino + Tablet [link]
- new kinds of ambient visualizations of air pollutants (e.g., [link])
- new mobile application with routing navigation algorithms and interfaces that provide an accessibility score for individual routes in [link]
- a “fog-of-war” type mobile exploration game that encourages bicyclists to explore new parts of the city (unexplored areas are blacked out and only become visible when you bike through them; gamifying biking).

Part Two

Select two ideas from your list and write up an “elevator pitch” for each. The elevator pitch itself should be no longer than two paragraphs though one is likely enough. Note that the projects:

- must be designed for a mobile device (e.g., smartphone or tablet)
- must utilize a mobile device’s built-in sensors for some part of the interaction including but not limited to: GPS, microphone, accelerometer, gyroscope
- must be accomplishable in ~15 weeks with four group members
- must have a target group of users (e.g., diehard video gamers, hipster bicyclists, baby boomers, college students)
- must be implementable in code; all project teams will demonstrate an interactive prototype at the end of the semester

You should absolutely use Google and search in the Apple Store/Google Play to investigate the novelty of your idea before selecting and writing your final elevator pitches. Do not submit ideas for applications that already exist—or, if you do, justify why your particular application idea is unique/new.

Materials Available to You

With my approval, you can “check out” one or more of the following pieces of technology for your project. Please use the list below to help inspire your ideas (e.g., how about building a running app that allows you to race your quadcopter—the quadcopter uses a target pace that you set or your pace average from previous runs). You can also use some of your own resources (I expect that you have your own computer for design and development).

Note: you don’t have to use any of this stuff, I'm just letting you know that it's available to get your creative juices going.

- A Microsoft Kinect (~10 available)
- An android tablet (~3 available)
- An android mobile phone (~2 available)
- An iPad (~2 available)
- AR Drone Quadcopter (2 available)
- Syma S107/S107G R/C Helicopter - Red (2 available)
- Arduino Leonardo (~5 available)
Today's Key Learning Takeaways

1. The value of iteration in design
2. Thinking through doing
3. Thinking through materials
4. The value of trying and failing early
5. Course mechanics/logistics
NEXT TIME
About you
About me (and my research)
What is HCI?
Design and Design Processes
Dark Palette
Light Palette
Smartsheet Gantt Palette
Light Palette