Milestone 0 (m0): Identifying a Good Project

1. Milestone Overview

In this mini-project, you will be asked to pitch a project idea to a class (your own idea or your take on another's idea). The goal is to recruit a team around a project idea or find a good team to join. This will also be the "practice run" for writing and receiving critiques.

2. Additional Information

There are two options for course projects in this class:

- *Option 1 (suggested for Ph.D. students): "Make Your Project"*
  Consider how your current research can be framed in terms of a user problem and recruit a team to work on this project. This may require you to frame your problem broadly and be open to thinking of technologies that are different from your current approach. For example, if your research is in robotics you may choose a context where you think robotics would be helpful to solve people's problems (e.g., assisted living facility), but you cannot assume that your final solution will be a robot. Option 1 is open to all students in the class, but several conditions must be met: (1) convince the instructor that this is a problem faced by people and that people other than students have this problem; (2) show evidence that you are connected to at least three users who are part of the demographic that faces this problem, who will be willing to guide your design.
- *Option 2: "Class Design Challenge"*
  The inspiration for this class is ACM CHI's conference student design competition (e.g., http://chi2015.acm.org/authors/student-design-competition/). Subsequent classes will be required to submit their work to this competition, but because this is a pilot class, we will be doing an internal design competition only.

Class Design Challenge

The theme for this year's project is "Helping People Recover from Addiction." Addiction disorders may include substance use (e.g., drugs, alcohol) or behaviors (e.g., gaming addiction, gambling). The disorders are characterized by needing increasing amounts of substance/behavior to achieve desired effect, consistently doing more than intended, and persistent unsuccessful attempts to cut down or stop use despite increasingly severe consequences. These disorders are a medical condition, which are estimated to cost the United States $374 billion per year. For example, 2004 estimates show that 67% of Americans drink alcohol, with 11.9% developing dependence to the substance; 45.8% of Americans try illicit substances during their lifetime, with rates of dependence between 10.3% and 67.8%, depending on the substance. Immediate treatments for addiction may involve medical intervention such as detox and rehabilitation therapy, but are rarely effective in the long-term unless paired with a maintenance program. The most common type of a maintenance program is the twelve-step approach, such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA), but different types of addiction may have different approaches. Can technology help people recover from various forms of addiction?

3. Tips for Succeeding on This Milestone

Good design competition submissions scope the problem to a subset and focus on solving this smaller challenge. For example, if you choose to work on the class design challenge, don't think about your task being "solve all addiction," but instead consider which subset of the problem may be appealing to you. Here are some examples of scoped problems in this space:

- Reducing anxiety and helping users deal with negative emotions in a constructive way
- Helping gamers set goals to avoid gaming addiction from taking over their lives
- Focus on a specific population, e.g., youth in recovery, GLBT recovery, etc.
- Tracking and encouraging an active recovery program (e.g., meeting attendance)
- Pick one of the 12 steps and consider if tech can help (e.g., step 10, "keeping a personal inventory" of you day)
- Technology to connect a large "sponsorship family"
- Help users identify and manage their triggers
- Helping addiction counselors figure out how to best help a newly-recovering addict
- Technology for supporting meditation and mindfulness
- Support users who feel "in a rut" in recovery in finding and exploring new meetings
- Tracking technology to help raise awareness of how your behavior compares to the general population (e.g., "today, you drank more than 95% of your peers")
- Supporting addicts/alcoholics in participating in service to the recovery community
- Consider how technology can help people smoke less and eventually quit smoking
- Helping people meaningfully connect with their sponsor as they work the steps
- Helping people from a recovery treatment or sober home stay in touch as they leave

4. Deliverables for This Milestone

- 2-minute "elevator pitch" for a general project idea or your take on another person's project that you would want to join. An elevator pitch must include a name for the project or team (think startup name) so that others can easily refer to it.
- Your project preference sheet, which will be used to create project teams.

5. Grading Rubric for This Milestone

- None (100% if you give a presentation).
- This counts as part of your class participation grade.

6. What Happens Next?

- I will look through all project preference sheets and assign people to teams, respecting preference order whenever possible.
- Critique forms will be given to each presenter.
- Presenters will rate all critiques and return them to me.

Milestone 1 (m1): Understanding Goals and Motivations

1. Milestone Overview

In this milestone, you will be asked to understand the problem space for your design. You will carry out a literature review, conduct a qualitative formative investigation with stakeholders, and present the distilled implications for design to the class.

2. Additional Information

This milestone is composed of four activities that should all be reflected in your presentation on this topic.

- *1: Literature Review*
  Understand what others have done in this space, particularly considering what work in other fields (e.g., psychology, social science, etc.) has discovered that can help guide your design. The best tool for this process is Google Scholar. The best resource for this process is your librarian at the Walter Library. I strongly advise writing short summaries of relevant papers.
- *2: Develop a Study Protocol to Understand Stakeholder Goals and Motivations*
  In class, we discuss ethnographies, interviews, probes, and participatory design strategies. Pick one of these methods and articulate a study protocol for your project. Some methods may require you to develop additional materials (e.g., lists of questions, materials for probes, etc.). I strongly advise creating a written protocol.
- *3: Conduct Your Study with Stakeholders*
  Connect with appropriate stakeholders and conduct your study, collecting data for your chosen methodology. Collect as much evidence as you can, however you should be aware that participants may not want to be photographed or video recorded. You should respect participants' rights.
- *4: Analyze Data, Focusing on Implications for Design*
  Follow the qualitative analysis strategies discussed in class to develop an understanding of the context from your data and to distill specific implications for design to guide the next phase of your project. I strongly suggest documenting your analysis process in writing and with photographs when appropriate.

3. Tips for Succeeding on This Milestone

This milestone is perhaps the most important one for the overall success of your project. Developing a deep understanding and collecting rich descriptions of the problem you are trying to address will help you situate your designs.

- Seek out my help early and often if you get stuck or have questions
- Use the informal critiques on 2/9 and 2/11 to get feedback and improve your work
- Start scheduling time with stakeholders no later than 2/10, as you will only have about a week to collect the data, so you want to start collecting as soon as you have formalized your protocol

- Though I will not be asking you to turn in your study protocol or lit review, writing can really help you articulate ideas and be specific about your plans. I strongly suggest you maintain at least a working document for each of these activities
- Document your process as much as possible to answer future questions and also to have great material for your m4
- The best way to troubleshoot your study design is to pilot it with friends or classmates

4. Deliverables for This Milestone

- On 2/9, be prepared to share your lit review in an informal critique with classmates
- On 2/11, be prepared to share your study protocol in an informal critique with classmates
- On 2/23, give a 7-minute presentation to the class reflecting your understanding of the design context. The presentation should reflect collected knowledge from the literature review and the formative study, as well as distilled implication for design in your next phase.

5. Grading Rubric for This Milestone

I will grade some aspects of this project, while other aspects will be evaluated from your classmates' critiques. This project is worth an overall 15% of your grade. The below rubric will be added up and divided by 100 to get your score on this project.

- Appropriate literature review: ____ / 20
- Appropriate study protocol: ____ / 20
- Appropriate data analysis: ____ / 20
- Insightful implications for design: ____ / 10
- Quality and clarity of class presentation: ____ / 10
- Average of critique content evaluations: ____ / 10
- Average of critique presentation evaluations: ____ / 10

6. What Happens Next?

- Critique forms will be given to each presenter.
- Presenters will rate all critiques and return them to me.
- If not all components of the rubric are clearly articulated in your presentation, I may reach out to you for additional evidence. For example, having a well-designed written study protocol to show me will give you 20/20 even if you didn't discuss it well in the presentation (however, I may dock points for presentation clarity).
- I may reach out to you with additional guidance before you begin the next phase.

Milestone 2 (m2): Generating Ideas

1. Milestone Overview

You will practice divergent thinking, generating many possible ideas for technology in your target space. You will present your process and your best ideas to the class.

2. Additional Information

This milestone is composed of three activities that should all be reflected in your presentation on this topic.

- *1: Generating Ideas*
  Generate at least 150 ideas relevant to your topic but hold off on evaluating them. Think broadly to include all sorts of solutions including hardware, software, human computation, services, etc.
- *2: Idea Selection*
  Get your list down to about 5 ideas. This isn't just about eliminating ideas that aren't great but also about considering which ideas could combine well and building on themes within your large body of at least 150 ideas. Try to avoid choosing multiple ideas that are very similar (e.g., 5 variations of a family location sharing app).
- *3: Sketch or Storyboard Ideas*
  Sketch or storyboard your 5 best ideas. The goal is for everybody to get some hands-on sketching experience, so each team member should be responsible for at least one of these ideas. You will not be evaluated on your artistic ability but you will be evaluated on your ability to get your idea across (think, xkcd comics!)

3. Tips for Succeeding on This Milestone

- The key to this milestone is to remain open to ideas and let your subconscious creative mind do the hard work. For this, you need to give it as much "good input" as you can.
- Seek out informal feedback from classmates, stakeholders, etc.
- Use your previous and ongoing work in the class, such as the design notebooks and the previous milestone, to inspire and guide your work
- Be inclusive of your teammates
- Pick a high-energy time to meet to generate ideas
- Do a short fun "warm up" before starting to brainstorm
- Leave a couple of days between the initial brainstorm and starting the idea selection, as a few additional ideas may trickle in after people "sleep on it"
- Warm up your hands before starting to sketch by doodling or tracing something
- Document your process as much as possible to answer future questions and also to have great material for your m4

4. Deliverables for This Milestone

- 7-minute presentation to the class reflecting your idea generation and selection process and showing sketches of at least five design ideas
- At least one idea that you personally have sketched or storyboarded, scanned or well-photographed and submitted through Moodle

5. Grading Rubric for This Milestone

I will grade some aspects of this project, while other aspects will be evaluated from your classmates' critiques. This project is worth an overall 15% of your grade. The below rubric will be added up and divided by 100 to get your score on this project.

- Evidence of having generated at least 150 ideas: ____ / 20
- Documented idea selection process, connected to previous work: ____ / 20
- At least 5 sketched or storyboarded ideas with lots of variety: ____ / 20
- Evidence that at least one idea was sketched by you: ____ / 10
- Quality and clarity of class presentation: ____ / 10
- Average of critique content evaluations: ____ / 10
- Average of critique presentation evaluations: ____ / 10
- Possible bonus (e.g., getting user feedback on sketches): ____ / 0

6. What Happens Next?

- Critique forms will be given to each presenter.
- Presenters will rate all critiques and return them to me.
- If not all components of the rubric are clearly articulated in your presentation, I may reach out to you for additional evidence. For example, having a well-documented idea generation step to show me will give you 20/20 even if you didn't discuss it well in the presentation (however, I may dock points for presentation clarity).
- I may reach out to you with additional guidance before you begin the next phase.

Milestone 3 (m3): Rapidly Prototyping Ideas

1. Milestone Overview

The goal of this step is to demonstrate that you are capable of quickly prototyping some medium-fidelity versions of at least two design variations.

2. Additional Information

People usually either love or hate this milestone. It requires creativity, courage to learn something new (and potentially fail), and commitment to bringing your ideas to life. There are two options:

- *Implement Two Prototypes (Recommended)*
  Pick two of your sketched ideas and try to bring aspects of them to medium-fidelity demo. The idea is not to have flawless, robust prototypes, but to have them functional enough to demo, get your idea across, and test to see which one people like better.
- *Implement Two (Significant) Variations of the Same Design Idea*
  If you one of your prototypes is clearly the way to go, but there is a fundamental question regarding some interaction component, you may choose to create two variations of the same idea (functional enough to test that question). For example, your idea might be a virtual companion animal to reduce anxiety. The fundamental question might be if it will work better as a tangible device or as a virtual app creature. You may build both of these versions to test this question.

The idea in both of these options is to have enough of the prototype implemented that you could potentially test it with users given some constraints. For example, you may make a robot with working sensors but that relies on your direct control to do things like navigation. Or, you may implement the "counselor"-side version of a recovery surface but keep the "patient"-side version as paper prototypes and sketches. Think about it in terms of: what kind of an initial test would show whether this idea is good or bad? Build towards that something that could be tested to answer that question.

3. Tips for Succeeding on This Milestone

- If you get stuck or start to panic, seek me out (earlier is better, not the night before it's due).
- If you have doubt whether your prototype is "enough," ask me early on. I may give you ideas to push it further.
- If you're doing something that was presented in a peer teaching talk, seek out the presenter for help and advice.
- Record short video versions of your demos. If things break during the class presentation, you'll have a backup to show.
- Creativity and courage are part of the grading rubric. It may be "safe" to just do some web programming you already know for both prototypes/variations, but that won't get

you courage points. Learn something new even if you don't get the same fidelity or functionality in the end.
- Order the necessary materials and reserve any time with equipment you may need as early as possible. Talk to me if it seems like something is a barrier to your productivity.
- Be inclusive of your teammates, let everybody claim responsibility for some aspect of the prototyping and carry it through.
- Document your process as much as possible to answer future questions and also to have great material for your m4.

4. Deliverables for This Milestone

- 7-minute presentation to the class reflecting your prototyping approach and showing a quick demo to the class
- 5 short sentences (140 character each) describing something you learned and/or did during the implementation phase. You are encouraged (but not required) to actually Tweet these with #umncse

5. Grading Rubric for This Milestone

I will grade some aspects of this project, while other aspects will be evaluated from your classmates' critiques. This project is worth an overall 15% of your grade. The below rubric will be added up and divided by 100 to get your score on this project.

- Demo of one prototype or variation: ____ / 20
- Demo of another prototype or variation: ____ / 20
- Creativity and courage of attempted prototypes: ____ / 10
- Evidence of having done some portion of the prototyping (tweets): ____ / 20
- Quality and clarity of class presentation: ____ / 10
- Average of critique content evaluations: ____ / 10
- Average of critique presentation evaluations: ____ / 10
- Possible bonus (e.g., higher fidelity, stakeholder feedback, etc.): ____ / 0

6. What Happens Next?

- Critique forms will be given to each presenter.
- Presenters will rate all critiques and return them to me.
- I may reach out to you to get more details about your prototyping contributions and I reserve the right to validate your answers by discussing with your teammates.
- If not all components of the rubric are clearly articulated in your presentation, I may reach out to you for additional evidence. For example, having well-documented code and demo to show me will give you 20/20 even if you didn't discuss it well in the presentation (however, I may dock points for presentation clarity).
- I may reach out to you with additional research opportunities if I you exceed expectations.

Milestone 4 (m4): Video of Project

1. Milestone Overview

In this milestone, you will create a "kickstarter"-style video (3 minute maximum) showing your project ideas and your design process.

2. Tips for Succeeding on This Milestone

- Watch a few example kickstarter videos online to get an idea of what works and doesn't
- Start collecting photographs and/or short videos of your process starting at m1
- Target your video at a general audience
- Use the resources available in Walter library (SMART) to get access to better film equipment, editing software, advice, etc.

3. Deliverables for This Milestone

- A short (up to 3 minute) video providing an overview of your project. You are encouraged (but not required) to share this video online.

4. Grading Rubric for This Milestone

I will grade this milestone by adding the below rubric items and dividing that score by 100. This milestone will be worth 5% of your final grade.

- Video is well-paced and engaging: ____ / 20
- Video describes and motivates the problem: ____ / 15
- Video provides a description and/or footage of the design process: ____ / 15
- Video describes and explains your proposed solution: ____ / 15
- Video describes the next steps or broader applications: ____ / 15
- Video is technically well made (e.g., easy to hear, see, etc.): ____ / 15
- Video credits all project contributors: ____ / 5

5. What Happens Next?

- We will have all the videos playing on the last day of class.
- I will watch all the videos and grade them based on the rubric above.
- I will announce the milestone winner by email after class.

CS8980 Write Up

1. Milestone Overview

Write up your project in an extended abstract format.

2. Additional Information

You should submit a 6-page description of your project (covering each part of the process) using the CHI extended abstracts format (http://chi2015.acm.org/authors/format/). Other formats may be acceptable if you have a specific venue in mind—check with me first.

Teams with multiple CS8980 members may work together on the paper. You may include CS5980 members in the paper writing if they volunteer their time.

3. Tips for Succeeding on This Milestone

- Take a look at past years' successful extended abstracts at CHI 2014 (http://dl.acm.org/citation.cfm?id=2559206 > click "Table of Contents" tab).
- Use the opportunity to practice academic writing by maintaining an academic tone, citing references, etc.
- Make sure that the "authorship" area gives credit to all those who contributed to the project. Do not submit anything to a conference without all the authors signing off.
- Keep in mind that this format allows you to include images and figures without exceeding page length by utilizing the left margin.
- You are strongly encouraged to extend this work as appropriate and submit it to an appropriate publication venue. I can help, if this is your goal.

4. Deliverables for This Milestone

- 6-page description of your project (covering each part of the process) in CHI extended abstracts format.

5. Grading Rubric for This Milestone

I will grade the papers using the rubric below. This portion of the project is worth an overall 10% of your grade. The below rubric will be added up and divided by 100 to get your score on this project.

- Introduction: ___ / 10
- Related work and citations: ___ / 15
- Description of formative work: ___ / 15
- Description of process: ___ / 15
- Description of prototypes: ___ / 15
- Discussion of future work: ___ / 10
- Use of tables, figures, and images: ___ / 10
- Correct format, length, proofreading, etc.: ___ / 10