

Design Challenges

We offer three design challenges for you to choose from. Read the descriptions in detail and pick one to pursue. Traditionally students consider desktop or mobile apps as the mainstream software/hardware platform to build their prototypes. This year we offer the possibility to build your prototypes in metaverse.

Design challenge I: All about music

Beginning in 2003, streaming services are responsible for our daily consumption and discovery of music. The major players in this market are Spotify, SoundCloud, Apple Music, Pandora, and Amazon Music. Reportedly Spotify has about 286 million active users with a music library of 50 million songs. Yet many users complain that despite advanced recommender algorithms they have trouble experiencing good music beyond what they already know. The Spotify's discover weekly was dubbed "discover weakly". One main problem is perhaps recommender algorithms often favour the most popular pieces. The other complaint is that these platforms hardly associate our music needs with where we are, what we are doing, the current weather, and our current mood.

This challenge is to build a new interface for users to consume and discover music.

Suggested questions for domain research

- 1) What are different ways of describing music? The basic ones is by artist, album, and the title. But there are other ways: chords, timber, pitch, rhythm, even lyrics.
- 2) Why people call music the language of emotion? Dig deeper and find out how music allow people experience different emotions? And how music can regulate our emotions. From this perspective, is there a way to design a completely different interface for us to experience music from the point of view of our emotional needs and objectives?
- 3) What is emotion? How do scientists represent emotion?
- 4) What is emotion recognition in natural language? Can we apply this technology to emotion recognition in music? Or does this technology already exist?
- 5) What are some of the automatic ways of recognising human emotions? From our words, facial expressions, voice, gesture? Perhaps there is a link between this technology and a music interface that allows music discovery based on its detection of our emotion/mood?

- 6) When new music is proposed to users, currently the only way to get feedback from users is the like/dislike button. It's often really tedious to interact with such systems. Is there another more smooth interaction model you can think of?
- 7) What can your interface do to educate users about their mood regulation? Can you integrate this information with the music needs they may have? This suggests a conversation between the system and the user.
- 8) Mood-based classification and exploration system

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Examples:

Spotify

SoundCloud

Amazon Music

Design challenge II: Change

Bad habits are hard to change. Smoking, sedentary lifestyle, procrastination, over spending are some examples. Once these habits establish, it's hard to change them even when we want to. Sometimes we also need more information to make the informed decisions to change.

Can technology help people and communities change their behavior to meet their goals? Technology (computers, mobile phones, tablets...) can help by providing information and by reminding us. Furthermore, it can connect us with other users who are interested in the same change program. Change might mean exercising more, eating healthier, spending money wisely, helping make a more sustainable planet, or participating more actively in local government. How can we recognize when change needs to occur and determine the appropriate goals? What methods can be effective in triggering and maintaining change?

This challenge is to design an interactive product to facilitate personal or social behavior change.

Suggested questions for domain research

1. How do people kick undesired habits and build desired ones? What role does being aware of these undesired habits play in building desired ones?
2. What role could incentivizing people have in nudging them in a certain direction?
3. How can technology monitor personal health? How can health status be conveyed to people to lead to better health?

4. Can technology provide a window onto the environmental and labor practices behind products? Or steer people toward decisions that align with their values?
5. How might technology help people understand how sustainable their decisions are and make better decisions? Like buying local food, using less energy, avoiding cars, and reusing rather than buying new?
6. How might interfaces increase mindfulness?
7. What's the most effective way to join people together to help a cause?

Examples:

[CarbonStory](#) is a crowdfunding site for climate change projects that uses gamification techniques to engage users.

[Instead](#) encourages small lifestyle changes to save money that can be donated to non-profits.

[Fitbit](#) uses reports to recommend health targets and peer comparison to increase motivation towards wellness goals.

[Budge](#) lets friends challenge each other to anything and the loser donates to a charity.

[Awareness](#) plays the sound of a Tibetan singing bowl after every hour of continuous computer use as subtle awareness that will not "nag you or force you to stop using your computer."

[Quitnow](#) provides educational resources, expert coaches, and interaction with community members also trying to quit smoking.

Design challenge III: Empower

Assistive Technologies are design interventions to serve users that present different and often challenging needs. These users may have sensory difficulties like blindness or deafness, or they may have a physical condition that prevent them from speaking or a motoric impairment that preclude their operating devices in a traditional way (e.g., tremor or paralysis), or they may present one of myriad cognitive syndromes that make their lives a challenge. A huge opportunity exists to do good things by applying our design skills to these populations, all the way down to specific individuals, who present different needs and abilities.

This challenge is to create an Assistive Technology.

Suggested questions for domain research

- 1) Who are users of special needs? Look around and pick a population
- 2) What are some of the difficulties of technology adoption for users with special needs?
- 3) What are the most difficult interaction tasks they face?

4) How can a special interface help them?

Example scenarios:

- A non-vocal individual participating on a debate team or at a poetry slam
- A blind person navigating an unfamiliar part of town after being dropped off by their self-driving car service
- A person with speaking disability calling 911 and describing where she is

You could adopt an inclusive design strategy that allows someone with a sensory impairment to more effectively use an existing technology. You could just as validly create an all-new technology that offers opportunities for the disabled to participate in a domestic or public setting, for work or for play. You may want to be very specific (e.g., a non-vocal individual participating on a debate team or at a poetry slam) or more general (e.g., a blind person navigating an unfamiliar part of town (after having been dropped off by their self-driving car service)). You can apply what we know about social networks, gamification, the internet of things, wearables, or hacker spaces. You may investigate why specific groups of individuals face more challenges and then experiment with ways to overcome those challenges. You may address specific challenges in an occupational setting, or with mobility, or in learning, or with living independently, or in entertainment – choose your own or do something that crosscuts all of those.

You may come up with an inclusive design approach that makes existing technologies work for a broader set of users or you may find opportunity in emerging technologies (e.g., 3D printing, nanotechnology, modular robotics, drones, wearables, programmable matter, or whatever). Push the envelope...expand the discussion and the possibilities...empower people!

Examples:

MindDoc was developed by clinical psychologists in close collaboration with leading researchers for those who want to learn about emotional well-being or who suffer from mild-to-moderate mental illness including depression, anxiety, insomnia, and eating disorders. It's available in Google Play.

Timeless connects Alzheimer's patients with their friends and family, reminds them of daily events, and helps them remember their loved ones. It's available in Apple Store.