Design 03 // Team 0x11

Team 0x11 (a.k.a. Group 17)
Kevin Kim
Samantha Lai
Joyce Luong
Jarrod Schnapper
Kushal Singh

CS160 // Design 03 // Team 0x11
October 1st, 2018

Brainstorming

Over the course of several brainstorming sessions, team 0x11 came up with the following ideas.

1. Isolating sounds so that sounds from different sources can be played separately.
    a. Adjust to pick up the sound of person you are facing.
    b. Separate sounds and captions to your phone.
2. Uber but for therapy dogs
    a. An application that allows users to request therapy dogs on an on-demand basis
3. Headspace for anxiety
    a. Series of exercises to relieve stress, and gamification of exercises that help you relax
4. Simulated echolocation using camera and auditory cues
    a. The phone converts the visual field and clicks to audio cues that describe the surrounding for the visually impaired, similar to how bats use echolocation
5. Recoloring scenes for color-blind people
    a. An application that re-colors scenes for color-blind people based on the specific type of color-blindness they have
6. Identifying when the user is too fixated on one thing for a person with autism.
    a. Signifies/Notifies the person with other small tasks and bother them till they are finished.
7. Control darkness of glasses for laser eye surgery recovery
    a. Allows to reshade your glasses using application to help reduce light exposure to your eyes.
8. Biosensor for depression and anxiety
    a. Uses smartwatch (or phone camera) to take heart rate along with other health vitals, such as sleep and caloric intake, to determine susceptibility to depression and anxiety.
9. When-to-cross
    a. Timer to inform the vision impaired when to cross to streets.
    b. Tells how much time they may have through feedback (improving the current system).
10. Teaching visually impaired users to listen to faster audio
    a. An application that helps visually impaired users develop stronger auditory senses via a prescribed program that gradually plays selected readings faster and assesses users before going to the next level
11. Selecting a kind of therapy based on your level of depression
    a. Based on user's personality, indicates best therapy choices in a that user's location

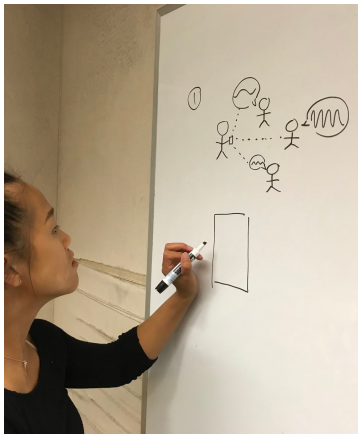
    b. Shows what resources are nearby for people that suffer from depression
12. Identifying people (for face blindness or autism)
    a. For those who have trouble remembering faces or who suffer from prosopagnosia, this mobile application can indicate to the user who they are talking with or people in their vicinity that they know
13. Identifying objects (for visual impairment)
    a. Pointing the camera at objects indicates what objects are ahead or what object someone is holding
    b. Can also indicate greater specificity, such as if the item has certain personal value (such as a photo with people the users knows)
14. Picks up your emotional state and recommends things it knows you like
15. Instant voice to text.
    a. Captions for hearing impairment, such as sounds from TV, movies, musics, or conversation.
16. Music beat to vibration converter
    a. An application that maps music beats to vibrations so hearing-impaired people can experience music
17. Translating music to ASL on the fly
18. Shazam/spotify auto scroll lyrics (for hearing impaired)
    a. An application that translates music to lyrics (speech-to-text) for hearing-impaired people and translates lyrics to music (text-to-speech) for vision-impaired people
19. Learning how to speak with natural intonation (for hearing impaired from birth)
20. Gamifying the health lifestyle
    a. An application that gamifies fitness and health-related activities, thus making health education accessible to everyone
21. Navigation map for impaired movements.
    a. Multiple options:
        i. wheelchair accessibility
        ii. avoiding stairs
        iii. allowing certain amount of stairs (longer route without any stairs vs few stairs but shorter distance)
        iv. elevator/escalator locator
        v. finding wheelchair accessible restrooms
22. Translate unintelligible pronunciation into understandable form using frequency vibration to text, etc.
    a. An application that uses Fourier Transform to isolate individual sounds from noisy signals.
23. A general DSP app for UC berkeley - lecture notes, exam time reminders, etc. Phone calls, lectures, any form of speech to captions.
    a. A centralized system for DSP students at Cal that
    b. Analogous to CalCentral, but specifically catered toward DSP students
24. A app for visually impaired people to make art in an auditory way.

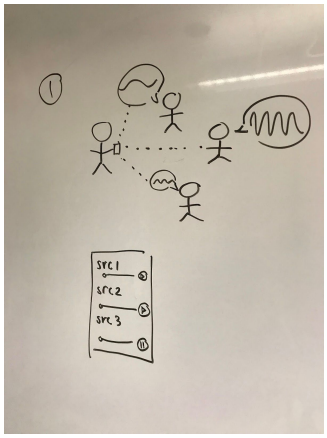
    a. Turning pictures and paints to different set of auditory sounds.
25. App that squishes other apps into smaller boxes so they can be used one-handed.
    a. Allows either right hand only or left hand only accessible buttons.
26. App that recolors screen to use color-blind friendly colors
    a. For pictures, applications, videos, etc.
27. New key gestures to replace double-pinch to zoom and other hand related gestures
    a. Creates copy of commonly used apps as a skin and override with specific new gestures
28. An app that reminds people to self-care
    a. A mobile reminder application that buzzes or pings to remind the user to do basic daily necessities (like drink water every 30 mins, eat meals, get haircuts, etc.)
29. An app that provides free one-on-one tutoring to struggling students and measures their performance
30. An app that allows low-income parents to figure out how to send their kids to good schools, what bus schedules are, remind parents to apply for free/reduced lunch or gifted and talented programs etc.
31. An app that smells stuff and tells you if it.
    a. There exists a sensor that can break down particles and identify chemical compound to figure out the smell by its chemical components.
32. An app that tells you if things are hot/cold.
    a. Using infrared and camera to indicate temperatures.
33. An app that connects users to volunteers and sets up a video chat so a blind or visually impaired person could ask volunteers to describe or direct them places
34. High or low pitched sound depending on brightness
35. Motion detector.
    a. Notify visual impaired person if there is something coming toward them.
36. Phone vibration and other indicators when you need to get off your stop on transit.
37. Therapy app for brain injury.
    a. Keeps log in order to help avoid secondary injury.
    b. Auto contact for emergency.
38. Physical therapy progress tracker - holds you accountable for doing exercises
    a. An application that monitors off-site patient-physical therapist interaction
    b. A lot of times patients are instructed to do exercises at their home, so this application will hold patients accountable to their goals
39. An app to teach hearing people ASL
40. App that tells you about programs (food stamps etc) that you have access to
    a. Accessibility to healthcare programs
    b. A mobile application that uses your location and any provided information to indicate social services and programs nearest to users that they can access
41. An app that reads menus.
    a. With previously inputted information, helps avoid certain types of foods if you have allergies or just straight up don’t like certain food.

42. App to speak for mute people
    a. A mobile application that allows mute people to type in what they want to say and then speaks that text out loud
43. App that identifies dollar type and denomination/coin type, etc. for blind people.
    a. Take picture of the bill or coin to find the value.
    b. Can also function as a currency converter, so if a user is traveling abroad, then the application identifies the foreign currency type and value and then converts that into a value that's more known to
44. App that helps blind people write their names in a straight line.
    a. Using camera and indicate when you are going off the line.
45. Grocery store navigation.
    a. Finds the price and also explains what product you're holding or looking at.
    b. Maps out the grocery store.
46. Journal app for self reflection on anxiety or depression
47. Zoom camera for the visually impaired.
    a. Physical zoom based on camera
    b. If using a digital device, like a computer, virtual zoom with phone using the camera on the phone.
48. Keeping in touch with a tutor and progress checking.
    a. If you have a learning disability/logging ecosystem that connects patient with doctor/teacher/PT.
49. App that keeps track of important milestones/memories for people with memory disabilities.
    a. Some signifier that helps trigger the memory.
    b. Family or ones with authentication can help input these signifiers to balance the workload.
50. Presenting news articles from various sources.
    a. Liberals to Conservative and separate them accordingly.
    b. Grouping by topics, and showing all the articles by topic without showing the news source until the end of the article to avoid bias.
51. Technological assistance for the technologically disabled:
    a. Crowd sourced, easy to use info regarding common tech apps for people who have trouble learning technology
    b. Share what they learn and their experiences

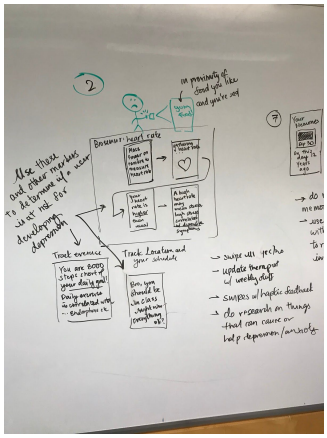
CS160 // Design 03 // Team 0x11
October 1st, 2018

Session Pictures

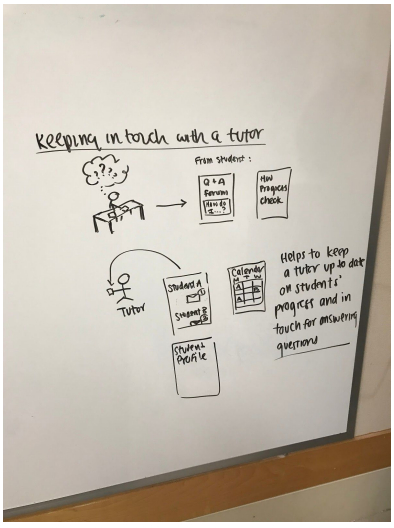




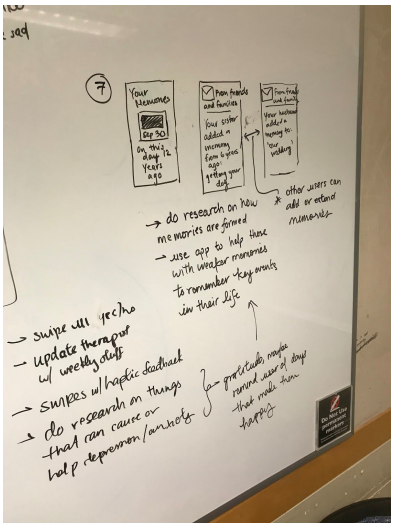
Brainstorm Idea 1 : Isolating Sounds



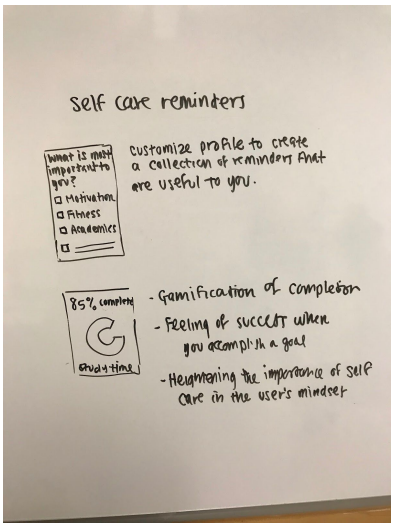
Brainstorm Idea 8: Biosensor for Depression and Anxiety



Brainstorm Idea 48: Student/Tutor tracking

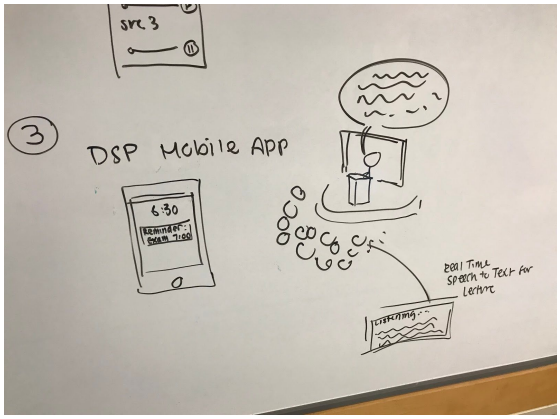


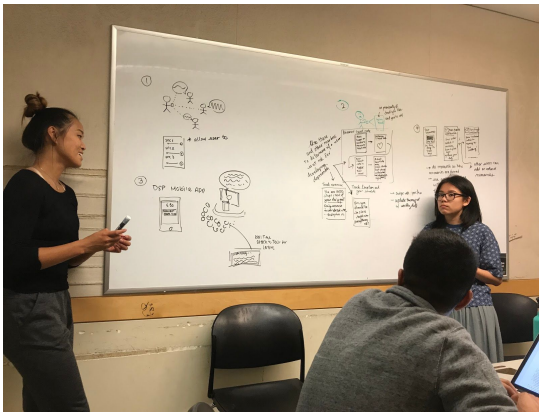
Brainstorm Idea 49: Memory Milestones and Collection



Brainstorm Idea 28: Selfcare Reminders

CS160 // Design 03 // Team 0x11
October 1st, 2018





Brainstorm Idea 23: DSP app for Cal

Idea Selection

Idea 1: Identifying objects (for visual impairment)

The reason we chose this idea was because we thought it provided true value to visually-impaired individuals by indicating what objects are surrounding them. Based on how frequently certain objects appeared, the application could also indicate with greater specificity whether the image/person has significant personal value. Among our other ideas, this application seemed like it could be used on a daily basis by visually-impaired individuals. However, we realized that the overhead for learning the machine learning tech stack and training our models would far exceed the amount of time we could otherwise spend on the front-end UI components and user experience, which is why we ultimately decided against it.

Idea 2: Data Driven Therapy

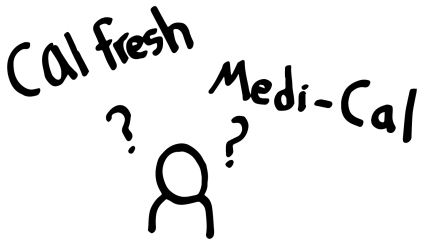
Given that mental health is a common issue on campus, we considered creating an app that would help students monitor their mental health and provide avenues for help. We found that we could synthesize multiple ideas from our 50-item brainstorm into one app. For one, this app would allow users to monitor their daily mood and track biomarkers (such as heart rate), as well as data such as their location or amount of exercise they are doing (imported from other apps). This data can be synthesized and correlations can be drawn and given to the user to analyze habits and inform their future choices.

Idea 3: Finding Social Programs and Resources

There are numerous state and federally run social programs, but it can often be difficult to find and identify which of those programs one is eligible for and has access to because of wording, language barriers, lengthy forms, etc. Additionally, it can be difficult to even discover programs that exist. We believe the challenges posed to recipients of these programs should not have to struggle to find and access what they rightfully deserve, what could alleviate many issues they may be facing . We liked this idea because of the wide variety of ways we would be able to increase access for people who are not only disabled, but also for most people in general -- it improves access universally and could potentially be scaled to work on a local, state, or even national level.

CS160 // Design 03 // Team 0x11
October 1st, 2018

Finding Social Programs and Resources



Our main target group for this application would be those individuals who potentially qualify for social welfare programs, but may not be aware of them because of a lack of knowledge. We also hope to provide for people who want an easier or more convenient way of finding social welfare programs available near them. These target groups can best be described as low-income students or families attending or residing near UC Berkeley. They also may include families or individuals with different language backgrounds that may require assistance with the discovery and completion of these program applications.

For our interview plan, we are looking to start off locally here at Berkeley, taking advantage of some of the campus organizations that revolve around social welfare programs, such as the Social Welfare Graduate Assembly (SWGA) and The Berkeley Connect Program, which connects students to mentors in the Social Welfare major. We are planning to email the director of the program, Jill Duerr Berrick, to see how we can collaborate in a mutually beneficial manner. We are also looking to talk to some of the marginalized student orgs at Cal, such as the Students of Under-Represented Cultures and Ethnicities (S.O.U.R.C.E.) and the Asian and Pacific Islander (API) Social Welfare Caucus. In addition, we want to interview students residing in the Berkeley Student Cooperative, which is a housing program that targets low-income students who would not otherwise be able to afford a Berkeley education. Finally, we are planning to post surveys in some of the UC Berkeley Facebook groups (e.g. the official class pages), asking students questions about their experiences signing up for welfare programs, if applicable to them.

CS160 // Design 03 // Team 0x11
October 1st, 2018

The main problems we hope to address are barriers that prevent discovery and completion of lengthy social program applications. Our app helps to find the resources you are eligible for and assist you through completing the form. One additional problem we hope to address is a lack of familiarity in the language of the application; the app hopes to circumvent the language barrier by translating the given form into different languages, so users are able to fill out the forms more easily. Through the app, our target group will be able to quickly access available programs and view their application statuses and updates. There are web based solutions available; however, these solutions are not available to those who commute or are otherwise often on the go.

We believe that one unique value we could provide as a mobile application is leveraging a user's current location (via latitude/longitude information through Google Geocoding APIs) to suggest welfare programs in a user's community that he or she may not otherwise have known about. On the other hand, it will be easier to upload documentation via a camera app than with a computer, as a user would need to find a way to send that file to their desktop. Finally, mobile devices may potentially be easier to use and access than desktop devices, especially for those who may need these social programs the most. This is because mobile devices are more portable, more common, and more easily charged than laptops and desktops.