

CSE 155: Introduction to Human-Computer Interaction

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This document lists seven projects that are moderately comparable in workload. In the Group Formation Quiz, you will rank these projects based on your group's (or your, if you do not have a group) preference. I will then try to assign your group with a project based on preferences and experience. However, there is no guarantee that you will be assigned with your most preferred project. Students without group will be assigned to existing or newly formed groups. Group formation and project assignments are final once completed.

In each project, groups are free to choose:

- Programming language for development. C++, Java, HTML, JavaScript, and Python are preferred.
- Form-factor, unless stated otherwise in the project description, for example, whether the app will run on desktops/web browsers, mobile platforms, or both.
- Target user groups, unless stated otherwise in the project description. For example, adults, young adults, elderly people, children, people with a disability, etc.
- Interaction design and number: how many and what types of interactions are allowed within the application. The descriptions below include some examples, but groups are free to choose interactions that they deem appropriate for their projects.
- Input device or techniques, unless stated otherwise in the project description: whether users will use touch, keyboard and mouse, eye tracking using webcam or a commercial eye tracker, or other input device or techniques.
- Interface design based on the design guidelines taught in class.
- Freely available (or trial versions) of APIs and libraries appropriate for the project (following the 40% rule highlighted in the syllabus and the first lecture slides). This document provides some examples, but groups are free to pick different APIs and library, as they see fit.

List of Potential Final Projects

P1. EyeBook Reader

An application that enables users to control an e-book reader by tracking the users' eyes. Some example interactions are – the reader automatically scrolls down the page when the eyes are closer to the bottom lines, goes back to the main menu when the user looks at a button for 1,500 milliseconds, etc.

P2. Gestural Media Player

A media player that enables users to control media (either audio or video) by performing hand gestures. Some example interactions are, performing a hand gesture stops playing the media, a thumbs up gesture resumes playing the media, etc.

P3. Petbot

A chatbot that recommends the right pet for users from different breeds of dogs and cats based on their expectations (do not include more than 10 breeds each). For example, if the user desires a companion pet that is smaller in size, have short legs, smooth coat, and low maintenance – the petbot can recommend a Basset Hound.

P4. ScreenExchange

A currency exchange app that enables blind people to convert one currency to another (US to CA \$) using speech, touch, and screen reader. For example, the user slides her finger over all available options to hear them, speaks an option to select it, etc.

P5. VirtualTranslator

An application that enables users to take picture of text written in a language they are unfamiliar with (the text does not have to be handwritten) to translate to English. For example, the user takes picture of a menu written in Hangul, and the application automatically translates it to English.

P6. HealthMetrics Visualization

A mobile application that collects daily activities to assist users to reach their fitness goals, such as perform activities in regular intervals (e.g., every 3 hours), lose weight, increase overall physical activities, etc. You can use historical/sample data rather than actual data. The data must be visualized in a meaningful way and interactive so that users can understand the data and tap on it to acquire more information.

P7. SlideCall

A mobile application that enables users to call a small number of people (favorite contacts, at least 10) using different finger gestures on the display. For instance, a gesture drawing the letter “a” can speed dial “Ahmed”, a spiral gesture can speed dial “911”, etc.

Relevant Application Programming Interfaces

1. \$1 Unistroke Recognizer: <http://depts.washington.edu/accelab/proj/dollar/index.html>
2. Android Google Fit API: <https://developers.google.com/fit/android>
3. Botpress Chatbot for Developers: <https://botpress.com>
4. D3.js - Data-Driven Documents (Visualization): <https://d3js.org>
5. GazeCloudAPI: Real-Time Online Eye-Tracking API: <https://gazerecorder.com/gazecloudapi>
6. Google Cloud Speech-to-Text (Speech Recognition): <https://cloud.google.com/speech-to-text>
7. Google Cloud Translation API: <https://cloud.google.com/translate/docs/basic/translating-text>
8. Google Cloud Vision API for OCR: <https://cloud.google.com/vision/docs/ocr>
9. MediaPipe ML Solutions (Eye/Hand Tracking): <https://google.github.io/mediapipe>
10. Microsoft Azure Bot Framework: <https://dev.botframework.com>
11. Microsoft Azure Speech Translation: <https://azure.microsoft.com/en-us/services/cognitive-services/speech-translation>
12. Microsoft Azure Speech-to-Text (Speech Recognition): <https://azure.microsoft.com/en-us/services/cognitive-services/speech-to-text>
13. Open CV Computer Vision Library: <https://opencv.org>