

1. Group information

Group 3 Innovate Now.

Members: Cami Lacy, Grace Setiawan, Tushar Thonupunoori, and Sovannara Tav.

2. The criteria you used to evaluate your ideas:

- a) How well does it meet the user's needs and preferences?
- b) Measure the usability and simple design.
- c) Inclusive of accessibility design.
- d) What compatibility it would have for cross-platform?
- e) Measure satisfaction for how much it enhances human interaction.
- f) What is the scalability of the device?
- g) How feasible is this idea given the scope of the class and limitations?
- h) Does the idea better support communication and collaboration involvement for users?

3. Create a ~1-page write-up about your top, most liked idea, by describing the following:

Smart glasses similar to E.D.I.T.H from Spider-Man: Far From Home.

(3a) The primary user scenario you are interested in designing for:

Dahlia studies for her final exams week

Dahlia is a busy college student attending the University of Washington Bothell campus, and she works a part-time job at Costco. Balancing assignments from three classes and her work schedule have her stressed about time management. Recently, she accidentally forgot to make her car parking payment and had to go through the website to set up her account subscription again before she went to work. With so much to do, it is really important to her to finish the quarter strong with good grades so she can apply to her major. Dahlia has booked a private study room in the library and begins to tediously organize all of her notes for her exams that are occurring the next week. Could she prepare a study plan with some help?

<magic happens>

While working in the study room, Dahlia was able to quickly complete a great deal of her tasks: scanning her note sheets; organizing her homework papers online; reviewing important sections of her textbooks; devising a study plan for each of her three classes; visiting the Qualitative

Skills Center for tutoring through Zoom; and inputting all of her important dates into her calendar reminders. The time in the study room went rapidly, and Dahlia felt like she was finally ahead on all of the assignments she had to complete. She could finally follow the plan she created for her final reviews and was able to go to her work shift later that day relieved, without worrying about the deadlines that were approaching.

(3b) The type of HCI technique you are designing:

Voice interaction: Integrating a voice assistant such as Amazon's Alexa, Apple's Siri, and Google Assistant into the smart glasses to be able to provide hands-free voice commands.

Augmented reality: Displaying short information from the chosen voice assistant visually through augmented reality on the lenses of the smart glasses.

Gesture control: Allowing the user to interact with the smart glasses' features such as taking photos, recording videos, having a live video or audio call, and many more.

(3c) The aspects of communication and collaboration your project explores:

Allowing to interact with the smart glasses hands-free through voice commands, users can quickly access project-related information, make audio and video calls for meetings, send messages to team members, take photos and record live meetings, and many more without needing to use their hands or use an external device which can help with productivity and multitasking with other tasks which can be beneficial in a team setting where communication and collaboration are occurring.

(3d) Your initial thoughts on how you can prototype this concept (low-fidelity prototype? interactive mockup? Wizard-of-Oz?):

Our team determined that utilizing a low-fidelity prototype for this particular case would be the most realistic due to the scope of the class and the advanced technology we intend to model for users to test. It is unlikely that a high-fidelity level prototype would be achievable for this current course and implementation we chose. As noted in the lecture, the low-fidelity prototype is much more abstract (such as a poster board and sticky notes) that may use pencil and paper. Our team would be able to collaborate to design the glasses and illustrate the various features that would be included in their functionality.

We continued brainstorming how we could replicate the idea through wearing a simple pair of glasses and detailing the designed output we wanted in reality for reference. We could provide an interactive mockup of the user interface to indicate what features are provided and their flow when the user chooses to interact with it. Someone like Dahlia from the user scenario would be able to actively engage with the mockup and provide real-time feedback regarding what works and any improvements that could be made. For instance, Dahlia could imitate a study session she has and interact by taking pictures, viewing an interface through the smart glasses lenses, and

speaking to the chosen voice assistant. This pairs well with the Wizard-of-Oz prototyping which uses an illusion to emulate the project idea before creating it. The simple pair of smart glasses discussed previously would be used, we could demonstrate through just having a voice assistant present for the user to speak to replicate the act of speaking to the glasses. In a professional setting, this stage would reduce risk and enable our team to save money and time before creating a full implementation that could have more bugs than expected.

4. Describe your second-most favorite idea, in the same way as your top idea

A smart ring allows a user to provide finger input gestures for educational communication and collaboration tools.

(4a) The primary user scenario you are interested in designing for:

Peter's new workload technique increases his team's productivity and progress

Peter, an aspiring data analyst at the University of Washington Seattle, is currently collaborating alongside three group members to collect, clean, and analyze data from the Bellevue School District. One of Peter's responsibilities is to create executive document reports and presentations summarizing their findings and providing visualizations that allow the district's administrative staff to make better-informed decisions on how to improve the district for educators, students, and families. However, with limited motor movement, Peter resorts to using less intuitive, proprietary, and bulky hardware to be able to type and navigate through the software he uses to complete his responsibility. As a result, Peter feels that he is slowing down the team's productivity and progress by not being able to work as efficiently as his group members.

<magic happens>

In using a new piece of hardware to type and navigate through his software tools, Peter has cut down his workload by half with the hardware allowing him to more efficiently create executive document reports and presentations with its ease of interaction. With that being the case, not only does Peter feel thrilled to no longer use less intuitive, proprietary, and bulky hardware, but has allowed his team with the increase in productivity and progress to provide their deliverables to the district's administrative staff on time with a high quality and thorough analysis. As a result, the district's administrative staff with the provided information carried out quality-of-life changes for its educators, students, and families across the district.

(4b) The type of HCI technique you are designing:

Finger input gestures: The smart ring will detect a user's finger input gestures such as sliding their fingers, tapping, and many more forms of gesture which can be used to control various functions on software tools like navigating through the slides of a presentation or typing on a document. The smart ring would likely incorporate motion sensors to detect the orientation and movement of the user's fingers. In addition, the user would have predefined options for the finger

input gestures or they can create their own finger input gestures to perform certain actions on software tools based on their needs.

(4c) The aspect of communication and collaboration your project explores:

With this smart ring allowing for finger input gestures for communication and collaboration tools, this can increase the workflow and productivity in a good way for those who have impairment of various degrees and struggle when interacting with these tools such as typing and navigation. Third-party hardware and software meant to assist with these types of tasks when it comes to using communication and collaboration tools in a team setting may be less intuitive and bulky. Thus, this small form factor smart ring with pre-defined and custom finger input gestures binding to certain actions based on what a user needs can help address these issues that can occur in the process of communicating and collaborating in a team. Examples include a bind to quickly start an audio or video meeting, a bind to view scheduling meetings and assigned tasks, and many more. As a result, a user can dedicate their time and effort to focus on the more complex tasks and responsibilities when working in a team, thus improving the team's productivity and progress rather than wasting time dealing with the issues that may occur in third-party hardware and software assistant tools.

(4d) Your initial thoughts on how you can prototype this concept (low-fidelity prototype? interactive mockup? Wizard-of-Oz?):

A low-fidelity prototype could involve creating sketches or storyboards illustrating how the smart ring would be worn and how users might interact with it to perform various actions using communication and collaboration tools. These sketches can help visualize the concept and identify potential issues or design challenges early on.

For an interactive mockup, we could prototype tools or software to simulate the gestures and interactions that users would perform with the smart ring to perform actions of communication and collaboration tools. For instance, users would use the finger input gestures or tapping they would perform if they were wearing the actual smart ring. These gestures are then interpreted by software, triggering the corresponding actions within the simulated software applications. This allows for more detailed testing of the user experience and can help gather feedback from potential users.

For the Wizard-of-Oz, we could have a person wear a regular ring while another person acts as the wizard. This person observes and interprets the wearer's finger movements. The wizard then simulates the corresponding actions within the communication and collaboration tools, such as advancing slides in Microsoft PowerPoint or typing a document using Google Docs.