CSE 440 AD
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2F: Design Check-In (“3x4”)

Existing Tasks

Task 1
Benson has mild memory loss and is living on his own. He enjoys cooking for himself and his family, and spends a lot of time in the kitchen. He prides himself on keeping his kitchen clean and teaching his family how to keep their own homes tidy too. Lately, he has been forgetful when putting items away and will find items in places he would not normally put them, such as putting fruit in the pantry instead of the fridge or putting frozen items in the pantry. He is concerned that this is a waste of food and becomes irritated when he realizes he put it there.

Task 2
Janie has mild memory loss and is living with her daughter, Yuan. Janie has been a runner all her life and loves being active and moving around. She is also comfortable with using a smartphone for calling and navigation. Yuan is going away on a business trip for a week and is concerned about her mother’s tendency to wander out of the house.

Task 3
Andy is very new to memory loss and is living with his niece and her young daughter. Andy takes 50 mg of Sitagliptin once in the morning, but becomes irritated when his niece nags him to take it. Because of this, she has stopped reminding him to take the medication in the morning and they have gotten into a few arguments when Andy forgot to take the medication in the past. Andy wants to be able to take his medication without relying on his niece.

Task 4
John is a 70-year-old retired mechanical engineer who has recently developed short-term memory loss. He lives with his son and daughter-in-law, who both work full-time as an account and neurologist, respectively. John takes multiple medications a day due to having high blood pressure problems. However, due to his memory loss, he is having difficulty remembering if he has already taken his medication at the appropriate times throughout the day. John’s son and daughter-in-law are very worried about John’s ability to remain healthy if he cannot remember to take his medication. It is especially

worrisome because they are usually away during the day working, and cannot return home until the evening to check on John. They would like a way to stay informed in real-time if John has taken his medication, so that in the case he has not, they can gently remind him.

Task 5

Mary is a social butterfly, and loves going to different events and parties hosted by friends. She also has multiple doctor visits every month due to chronic back pain. Lately, Mary has been having trouble keeping up with her activities due the beginnings of mild memory loss. She has tried keeping a regular calendar, but since she is always on a go, she does not always have time to check her daily events. Mary wants a way to be alerted of her upcoming events without having to constantly check her calendar.

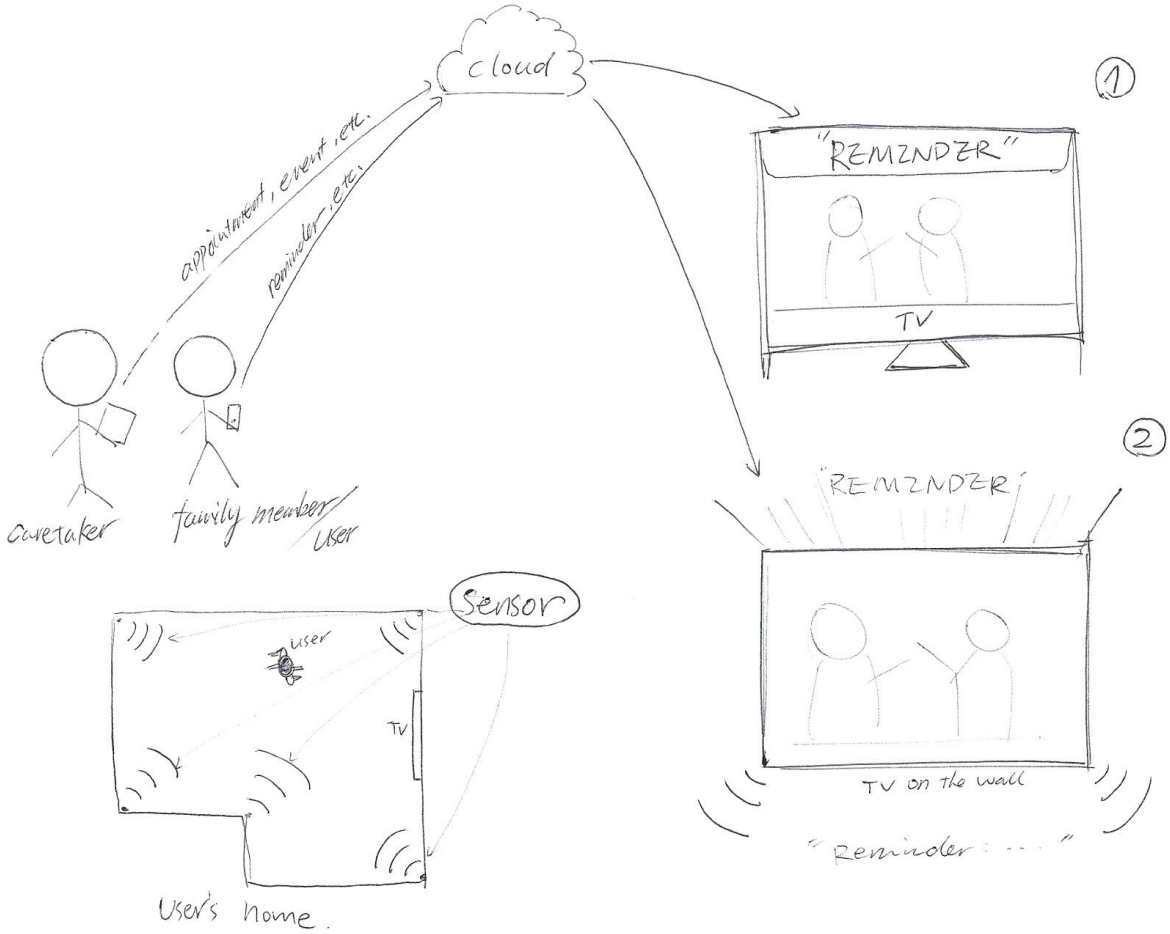
Task 6

Sarah has just been diagnosed with moderate memory loss. Sometimes, she finds it very difficult to even remember *what* she needs to remember. Recently, she has found that she forgot to write down things like important phone numbers and dates for various events, such as doctor's appointments and family gatherings. Sarah wants to find a solution that can learn what is important to her, and help her remember to write those things down, or better yet write those things down for her.

Design 1:

A notification system attached to a television that give visual and audio reminders as a person watches a show. Reminders would be set up by a caretaker or the user's family members or user themselves. If set by a caretaker, the reminder would have the option to include a voice recording so a familiar voice will remind the user, and not an unfamiliar machine voice. The caretaker can also record a video of themselves which will be displayed by the TV, to add another layer of familiarity. This solution would be able to remind the user of things such as appointments, scheduled events, medication and be paired with sensors in the house to remind them to do laundry or turn off the oven. Two methods of displaying notifications were discussed:

1. Using software to detect when ads appear on the TV and replacing the ad with a scheduled reminder. This would seamlessly blend into the established habits of the user and allow custom visuals for the ad, such as personal photos to be included in the notification.
2. Having a projector on the back of the TV onto a wall that displays a video if any and a banner. This would be less intrusive to a user that is watching a movie or a using a program on the TV that does not run regular ads.



Tasks:

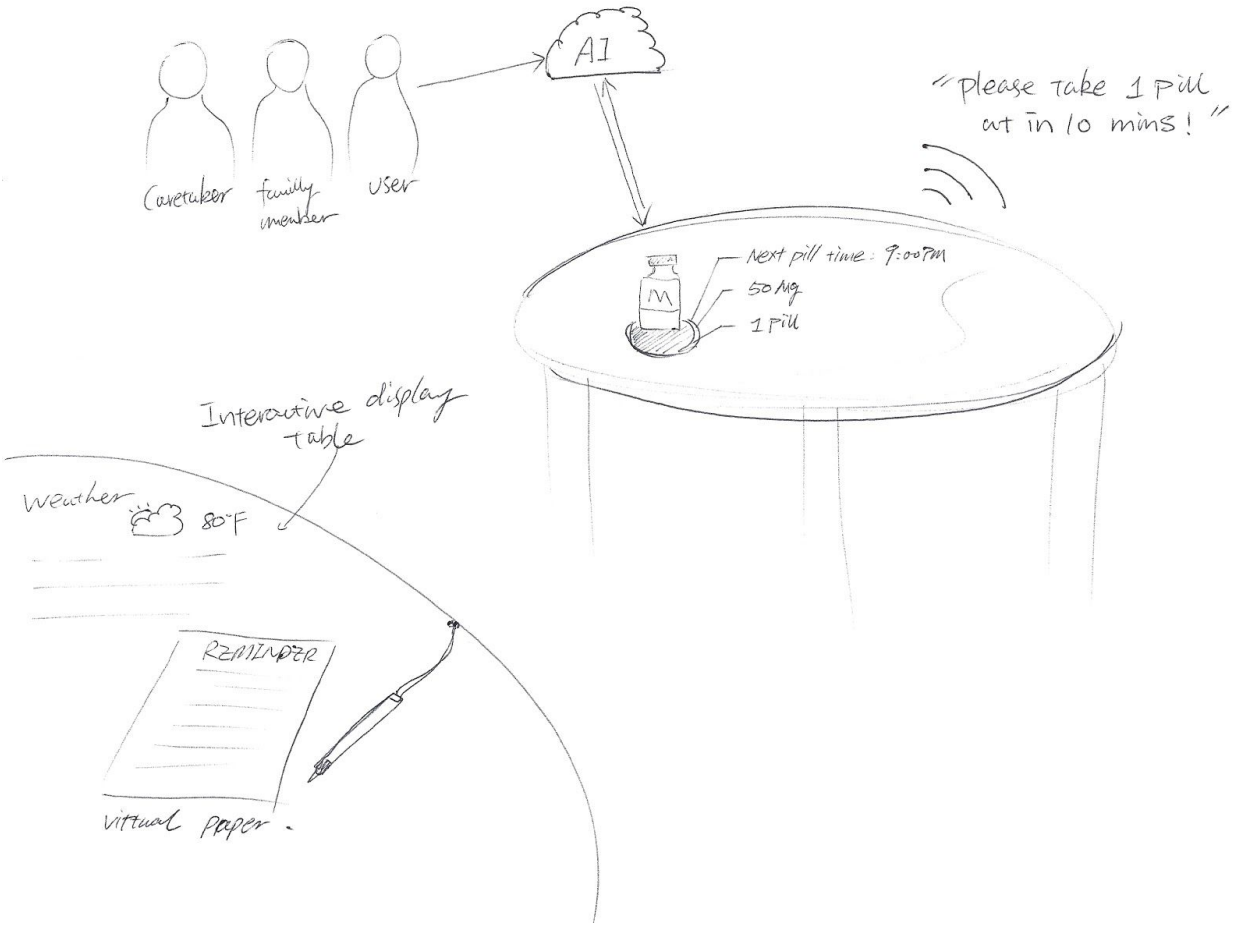
1) A caretaker sets a reminder for the user to take a medication, go to a place or complete a task. They include a photo of the location where the medication is stored, and record themselves reminding the user.
2) The user can also record their own message the same way, in case they have a personal reminder they want to make.
3) The reminder plays periodically up until the time the task is “due”.
4) The message plays when the user is close enough to the television. Otherwise, sensors around the house beep to indicate to the user that they need to get closer to the TV to hear a reminder.

Design 2:

A smart table that interacts with an individual who has mild short-term memory loss. The table has multiple features. First, the tabletop contains virtual paper which the user can write on using a special pen. The smart pen is not able to be fully removed from the table in order to prevent misplacement of the pen. Text on the paper will be parsed by the table, and information that needs to be remembered (appointments, dates, etc.) will be stored. Later, when that information needs to remembered, a voice assistant integrated with the table's UI will re-read the stored information to the user as a reminder.

The integrated voice assistant will also be used to help remember to take medicine. When a medicine container is put on the table, the table will be able to detect whether the medicine has been picked up at the appropriate time. If it has not, then the voice assistant will alert the individual. The smart table can also alert family members and/or caretakers when the medicine has been picked up through something simple such as a text message.

Finally, the integrated voice assistant acts as an AI that can answer basic questions that the user has, i.e. the weather, what appointments they have for the day, etc.

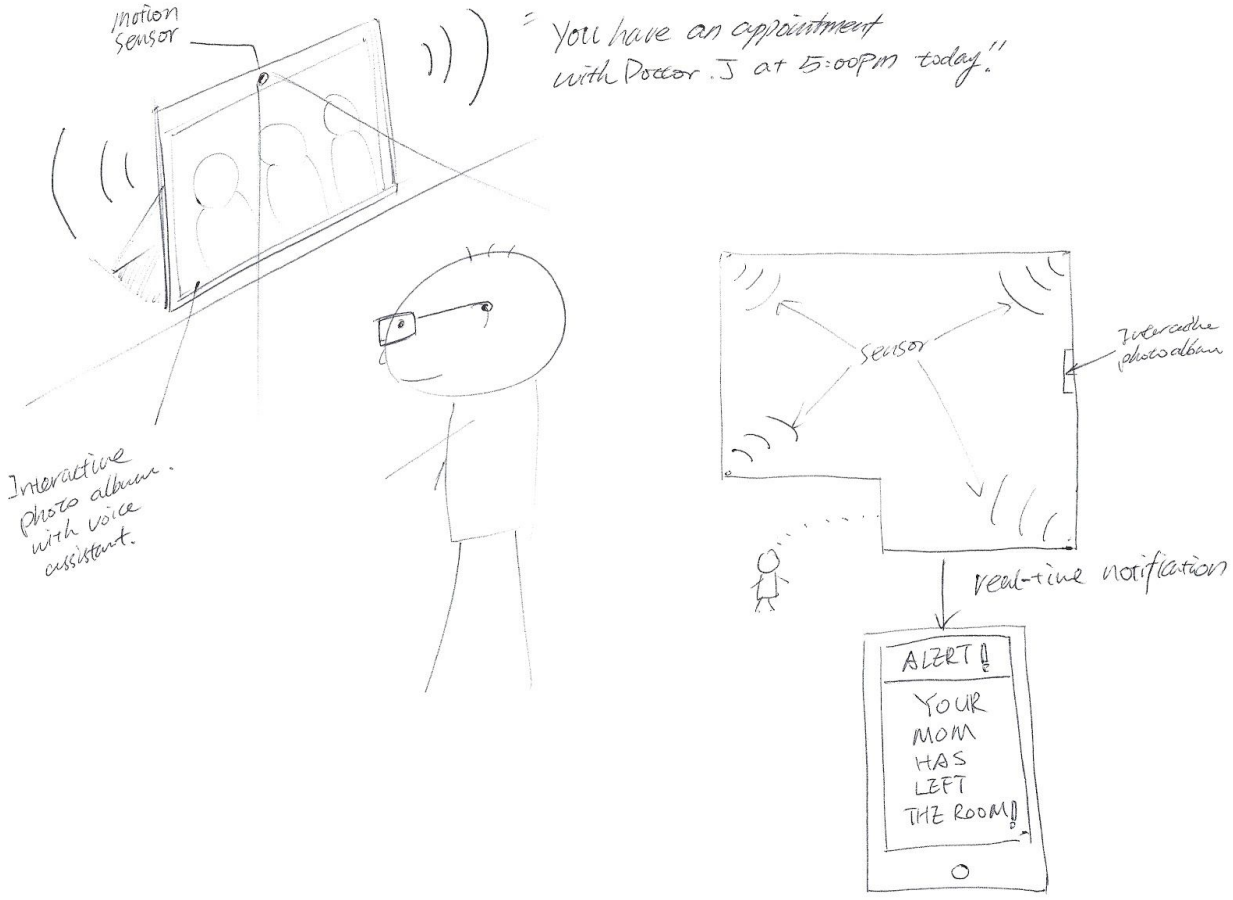


Tasks:

1) This device helps individuals remember the events going on in their lives. Using the smart table, a person is able to write down the different events they have coming up using the table's virtual paper and smart pen. Every day when they sit down at the table for meals or passes by it, they are reminded of the important upcoming events they have by the integrated voice assistant. Seeing all upcoming events visually also becomes easier than ever. Urgent information and upcoming events are physically outlined on the table itself.
2) A son and his wife are very worried about their elderly relative, John, since he has short-term memory loss. They use the smart table data to check to see in real-time if John has picked up his medication, which likely means that he has taken it.
3) An individual with short-term memory loss if frustrated with her inability to remember to take his own medication. She feels like her own independence is being taken away from her. Using the smart table, she is able to regain control back over life by being notified by the table when she has to take her medications.
4) In addition to reminding the user of important upcoming events, the integrated voice assistant can help record events and reminders via the user's voice. This provides more versatility versus simply writing down information that needs to be remembered.

Design 3:

An intelligent home sensor system with an interactive UI. Multiple sensors are set up around the home of the individual with memory loss. These sensors have multiple functions that enable the wellbeing of the individual and the peace of mind of the caretaker. The sensors are paired with an interactive UI in the form of an intelligent photo album. By default, the photo album shows pictures of loved ones, but it also doubles as a voice assistant that can help record important information and help remind the individual of important events they have coming up.



Tasks:

1) The sensor by the door detects whether the individual with memory loss has left the house. If they have, an alert is sent to the caretaker and/or family member of the individual alerting them of this.
2) Other sensors not only detect whether or not the individual is in the room, but whether there is a problem. For example, if the individual falls down, the sensor in the room will be able to detect this and alert the caretaker and/or family members.

3) By default, the intelligent photo album displays photos of loved ones and past memories. From our research, photos from the past are very therapeutic to individuals with short-term memory loss, and help the individual stay calm and collected when frustrated with their inability to remember things.
4) The intelligent photo album will be able to record and replay reminders. For example, if the individual has an upcoming appointment, the album will remind them of this via voice. If the user is not currently in the room where the interactive photo album is located, or they are not close enough to it, then the sensor(s) in the room that they are currently in will beep to indicate that they have a new reminder and that they should go to the room with the photo album to see what the reminder is.