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CS 732

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Homework 3

Handicap door opening buttons are a necessity for handicapped individuals to get into and out of doors. However, these buttons are often placed in inconvenient locations and sometimes do not work. A portable interface for opening handicap accessible doors would likely alleviate these issues. This interface is digital and could exist on a remote or a mobile phone. A persona of a target user is Bob Sinclair who is a college student temporarily in a wheelchair that struggles with getting through handicap accessible doors. More details about Bob are described in Figure 1.

A scenario for the portable handicap door opening interface is that Bob wants to enter the Perry Library. While approaching the building he opens the handicap door accessibility mobile application which shows all the handicap accessible entrances/exits for nearby buildings (represented by Figure 2) and selects the ramp entrance for the Perry Library on the map. Bob heads to the side entrance and goes up the ramp to reach it. When he gets positioned in front of the door, he selects the entrance on the map and presses the button labeled "Open" that appears at the bottom of the screen after selecting an entrance (Figures 3 and 4). The door opens and Bob begins to wheel himself through the door. While going through the door, Bob's backpack begins to slip off his wheelchair, so he stops and reaches back to put if back securely on his chair. The door begins closing while he is doing this, so he re-opens it while it is closing by pressing the "Open" button again. Bob is able to get through the door and into the library.

The use cases for this interface cover how a user can interact with the software to achieve their desired outcomes and how the system prompts and responds to user interactions.

1. The system displays the user's location.
2.   The system displays nearby handicap accessible entrances/exits on a GPS enabled map.
3. The user selects a handicap accessible entrance/exit on the map.
4. The system displays a button labeled "Open" for the user to press to open the selected entrance/exit.
5. The user navigates to the entrance, in the real world, and presses the "Open" button to open the entrance/exit door.
6. The user presses the "Open" button to reset the door open timer.
7. The user presses another area of the map to deselect the entrance/exit and return to the map to search for and select other entrances/exits.

A hierarchical task analysis for the portable handicap door opening interface breaks down the task of using it into sub tasks.

0. In order to open a handicap accessible door wirelessly

1. download portable handicap door opener interface
2. locate handicap accessible entrances/exits on the map
3. select entrance/exit
4. navigate to entrance/exit in real-world
5. press "Open" button to open entrance/exit door
6. go through the door

Existing users skip step 1 since they already have the application downloaded. Some users may need to complete step 6 multiple times to keep the door open long enough for them to get through it.

Low Fidelity Prototype Implementation

The low fidelity prototype implementation includes all the above-mentioned user interface functionality except for the timer displaying how much longer the door will remain open and the GPS enabled map. The latter limitation means that the functionality of only showing handicap entrances for nearby buildings is not implemented. To simulate this functionality, the handicap entrance buttons of other buildings disappear when the user is inside of a building.

Bob Sinclair

age: 20
residence: Old Dominion University
education: High School Diploma
occupation: Student
marital status: Single, without kids

I like anything that makes my daily activities more convenient.

Bob is temporarily in a manual wheelchair due to a leg injury. He often has difficulty getting through doors after pressing the handicap door opening button due to being inexperienced with maneuvering his wheelchair quickly. Also, he sometimes gets stuck behind the doors that open outward towards the button. Bob is an on-campus college student, so he goes in and out of buildings often during his day.

Comfort With Technology

INTERNET

SOFTWARE

MOBILE APPS

SOCIAL NETWORK

Criteria For Success:
Ability to get into and out of buildings efficiently, in order to sustain a schedule similar to other students

Needs
- Needs a way to open and get through doors without leaving his wheelchair

Wants
- To be able to navigate campus as quickly and easily in his wheelchair as he did when walking.
- His leg to heal so he can go back to walking

Values
- Convenience
- Minimal Frustration
- Safety
- Accessibility

Fears
- That he will miss out on opportunities and social experiences while in his wheelchair due to not being able to make it to the area
- That he will be stranded inside or outside of a building because he cannot get through the automated door or the door is not working

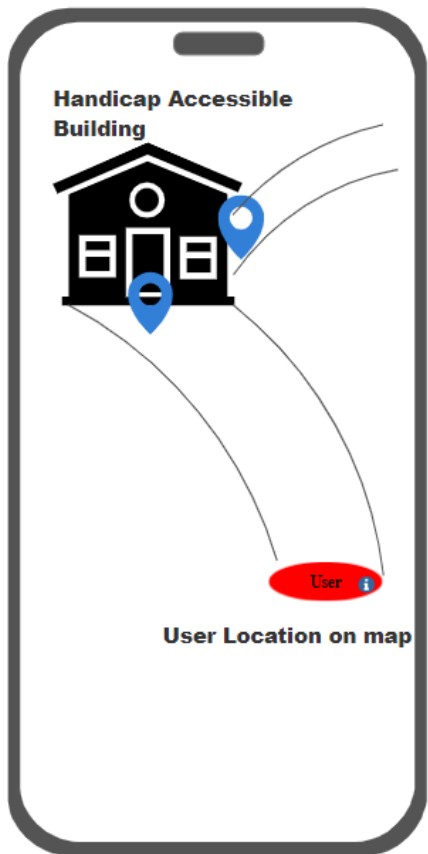**MOBILITY LABS**

Figure 1: Persona for Bob Sinclair

Figure 2: Prototype Frame showing all nearby accessible entrances/exits and the user's location.
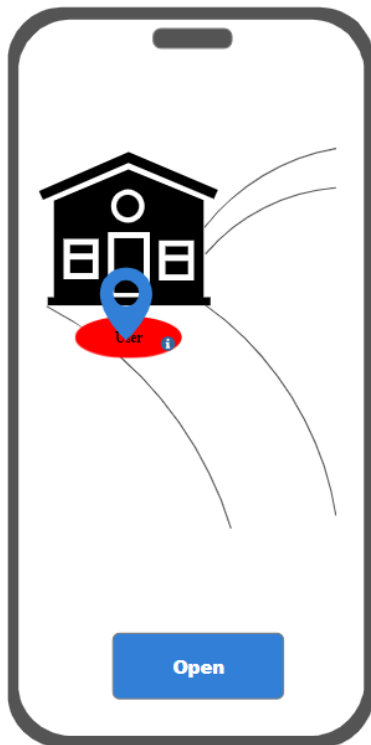
Figure 3: Frame for after user has selected entrance/exit and moved in front of it.
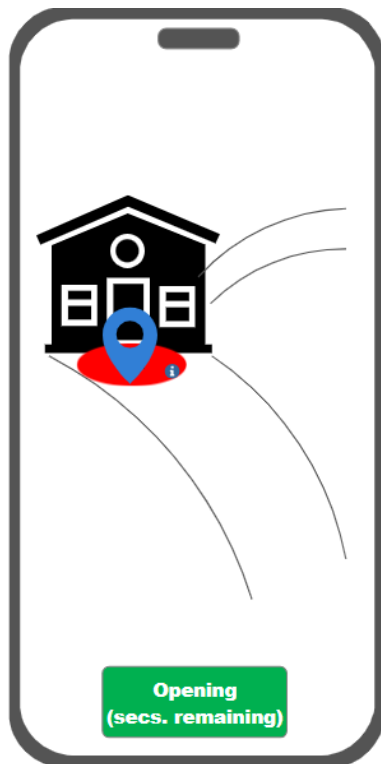

Figure 4: Frame after user has pressed "Open" button and is moving through the door.