Mobile Robotic Presence

Older patients and privacy concerns
Telepresence

• The use of virtual reality technology, especially for remote control of machinery or for apparent participation in distant events.
The Study....

- A set of two interviews with each participant
  - 12 participants (5 men, 7 women)
  - Ages: [66,88], $\bar{X} = 73.38$
- Participants reported living independently
  - Targeted healthy individuals
  - No cognitive decline
Health

- 92% of participants reported a 3 or better on their health
  - Just 0.96 people reported a 2 or lower
- That same fractional person was the only report of limited daily activities from health
  - Everyone else was seldom to never
The Robit
Session 1

- The participant controls the robot
  - Has a researcher present to help with nuances and prevent safety hazards
- Engages in neutral topics with a second researcher for 5-10 mins
  - Topics include: How are you; How's the weather, etc.
- First researcher interviews participant afterwards
Session 2

- Roles switch; Second researcher drives the robot
- Participant still talks to the second researcher through the robot
So why the flip flopping?

• Need to see if the results hold for both sides of the robot
• People may be more comfortable on one side or the other
Results

- Participants discussed more benefits than concerns
- Discussed more concerns when someone else was driving the robot
- Displayed a preference for driving themselves
- Displayed more preference for talking to family and friends over medical staff
What the participants wanted to know before purchase

Figure 5. What the older adults would want to know before using the system (% times mentioned)
Figure 4. Who older adults would contact with the system (% times mentioned)
Benefits and Concerns

Table 3. Most commonly mentioned benefits (N=174 codes)

<table>
<thead>
<tr>
<th>Benefit</th>
<th>% of times mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visualization</td>
<td>25%</td>
</tr>
<tr>
<td>Reduce travel time / safer travel</td>
<td>14%</td>
</tr>
<tr>
<td>Socialization / reduce isolation</td>
<td>13%</td>
</tr>
<tr>
<td>Convenience</td>
<td>9%</td>
</tr>
<tr>
<td>Health diagnosis</td>
<td>9%</td>
</tr>
</tbody>
</table>

Table 4. Most commonly mentioned concerns (N=124 codes)

<table>
<thead>
<tr>
<th>Concern</th>
<th>% of times mentioned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Etiquette refusing / ending call</td>
<td>18%</td>
</tr>
<tr>
<td>Privacy</td>
<td>15%</td>
</tr>
<tr>
<td>Less personal / lack of face-to-face contact</td>
<td>13%</td>
</tr>
<tr>
<td>Misuse / overuse</td>
<td>12%</td>
</tr>
<tr>
<td>Difficult to use</td>
<td>9%</td>
</tr>
</tbody>
</table>
And a….

Into….
Privacy Concerns in MPR

HEEEEEEY!!

A LITTLE PRIVACY PLEASE!
What is different?

- With Skype, your view is limited
- With telepresence, a person can move around, and view many things
What can be done?

- Alter the image going back to the user
  - Redact (Black Box)
  - Replace (In-painting)
  - Blur
  - Abstract
First Experiment

• 3 different scenes
  • Each scene had the 4 filters, plus a control, for 15 clips total
• 140 participants
• Each participant viewed each scene, but with different filters
• Filters were applied manually
Results

Percentage of Privacy Violations and Total Books Recorded

- Can't Tell
- Can't Observe
- Can't Discern
- Total Books Recorded

Legend:
- Control
- Abstract
- Blur
- Redact
- Replace
Second Experiment

• Instead of a video, use a robot in an apartment
• To apply a filter, a physical transformation must take place
  • IE. photos are replaced with blurry versions, stroller removed, bed sheet over the bedroom doorway
• 30 participants used
• Tried to see if someone can tell if a child regularly visited the apartment
Results

• 15 participants in the control group
  • 3 disagreed with “Children regularly visit”
    – 2 gave points to reinforce that children DID visit
• Fewer participants in the experiment group agreed with above statement
  • No statistics given
  • But we get fun Box and Whisker plots
Conclusion

- You can get better privacy by video manipulation
- There are other manipulation techniques
- And, the technology isn't good enough quite yet
Any more questions?