Augmented and Virtual Reality Tools to Enhance Acceptance and Adoption of Connected Home Technologies

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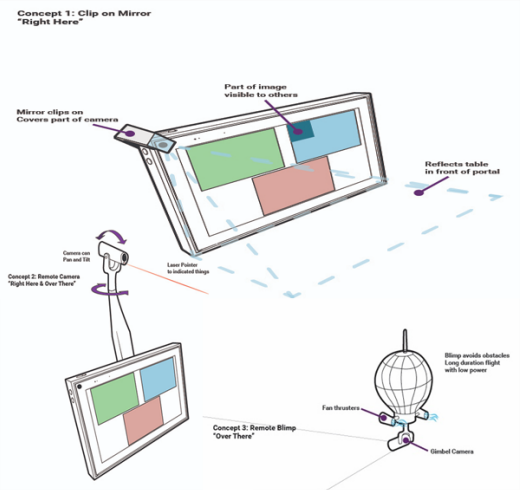
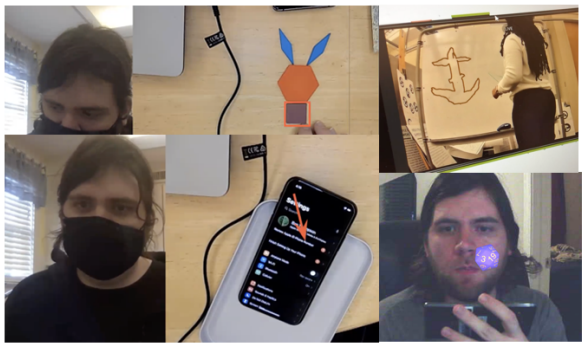
Over the course of previous studies, we have noted a lack of capabilities within current teleconferencing technology to properly assist in troubleshooting issues with smarthome technology. Over the course of the pandemic, teleconferencing solutions have become more important. As such, we are in the process of developing hardware and software solutions that assist in remote troubleshooting in various fields.



Our initial designs involved a desktop "here" solution, a Rotating camera "there" version, and a highly mobile "way over there" camera solution. Trial and error on these various versions led us to have to heavily adjust our prototypes.

After initial planning, we adapted the "here" and "there" solutions. The "here" solution (above) involves a camera mounted on an arm attached to a laptop, while the "there" solution (below) involves a remote controlled 360 degree camera.



Annotations

Our system allows both users to annotate arbitrary camera views with virtual content to convey spatial information that is otherwise difficult to communicate verbally. We tested our video conference solution in scenarios of physical manipulations of objects (top left), guidance through a smartphone's menus (bottom left), and through collaborative drawings (top right). Earlier tests involved 3d objects superimposed on an area that could be manipulated with a smartphone (bottom right). These evaluations and collaborative design sessions were done with our potential users as well as subject matter experts.

Future Additions

Based on our findings from the co-design sessions, we are creating a deployable telepresence package that can be used to support connected home projects within TechSAge and beyond. This includes making the camera arm smaller and more easily manipulable package that can be used by our target population. This also involves potentially adding in projections to the camera to allow annotations to show in the physical world.

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NIDILRR National Institute on Disability, Independent Living, and Rehabilitation Research
RERC TechSAge
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