

Science Investigation Project Report Booklet

Title: Assistive technology for home improvement

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Summary

We are three students who study computer science in 5th year. We were interested in making a 'smart house' for an elderly relative. We wanted to use technology to make life easier for people with reduced mobility.

Introduction

(hypothesis, research, why we choose this topic, what we hoped to achieve, brief description of your project)

During the pandemic many people lost carer hours. Some older people need strategies to enable them to be independent and stay in their homes. Young people use Alexa boxes to play music. Voice activated controls could be a common system in homes of aging people helping to keep them safer and comfortable.

If we set up a raspberry pi with smart bulbs and a microphone, we can use voice recognition to control the bulb and turn it on hands free.

Our equipment:

- mouse
- keyboard
- microphone
- raspberry pi 4
- smart bulb
- light unicorn hat
- monitor
- USB audio stick
- lamp

Background Research

We found out that voice activated controls are very useful for older people and for increasing their quality of life. We also found out that many are hesitant when they are older to use technology. We read that it is better to have someone who knows about tech and programming set it up and then to do workshop on how to use it. Getting it set up and having people comfortable by doing classes or lessons is important. Having a system that carers can feed into is also important.

Experiment Methods

Results

Result- The product



Conclusions and Areas of Improvements

We were successfully able to make a voice assistant that can take in commands using your voice and respond to you while performing actions like displaying patterns on a screen, telling you the time and date (which is good for Alzheimer patients) and turning on and off the lights.

We would like to go further and to include controls on house alarms, an electricity shut off switch on a cooker so if someone can't get to turn it off or a way to play audio books. It would be good for people with dementia or Alzheimer to be able to have friends and family to put in reminders like 'Kate will call for you in ten minutes to bring you to the library'. Thermostats should be easy to link in to voice control. Smart locks could help care giving from a distance.

References (list the names of the books and websites that you used in your research)

We used [GitHub: Where the world builds software · GitHub](#)

www.sofihub.com/2019/12/25/what-to-look-for-in-the-best-voice-assistant-for-the-elderly/

This article said that it is important others can put in alarms and messages into the system.

[Voice assistants and older people: some open issues — Monash University](#)

This said that older people have a poor attitude to Siri and Alexa. Any system needs to be very user friendly and make o/65 comfortable to have it around.