Smart Vending Machine Software For Specially Abled

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Problem Statement

There are a number of issues and problems faced by specially abled people due to which they feel alienated. For example, if they want to use a certain vending machine in a public place, they might feel a bit inconvenient & dependent on others for simple day to day tasks. So for even simple tasks if there is nobody around, they might feel helpless and there is no choice left for them either to leave that task or wait for someone to help them out.

From what we have recognized, whenever a specially abled person is trying to use a vending machine interface, he/she faces difficulty in using even the most simplest interfaces made for common people. When we talk about any automated system our first aim is to provide people with an easy interface accessible by all, which we see lacking in the normal vending machines or any commonly used software.

Our Solution

Aim / Objective

We aim to provide an easy Software Interface for specially abled, to allow them to use any vending machine or any other software that has an user interaction with minimal or no help required to perform any task.

Overview

Our software provide users with an easy interface , using head movements as cursor movements and eye blinks for product selection and confirmation.The main motive of our software is to elevate the customer experience, to reduce the problems faced by specially abled section of the society, and to improve the efficiency of the operations. We aim to provide a specially abled person a friendly software for a hassle free & fast experience for all kinds of customers.

Modules of The Project

Backend Components

- **Python Controller**
    1) Quartz : It is used to interact with the operating system and carry out events such as clicking and moving the cursor.
    2) Dlib : It is used to detect facial landmarks with high accuracy. Blinking detection in the project is done using this library.
    3) OpenCV : It is the Computer vision library which has C/C++, Python, Java interfaces. For this project, OpenCV in Python has been used.

Front-End Component

- **User Interface**
    1) Tkinter Based UI interface Integration.

Technologies Used

- **Python 3.6**
- **Open Cv**
- **Quartz**
- **Dlib**
- **Machine Learning**

Resources

Quartz : https://pypi.org/project/pyobjc-framework-Quartz/

Dlib Eye Blink Detection:
https://www.pyimagesearch.com/2017/04/24/eye-blink-detection-opencv-python-dlib/https://www.pyimagesearch.com/2017/04/24/eye-blink-detection-opencv-python-dlib/

Tkinter Modules: https://docs.python.org/2/library/tkinter.html

Python Modules: https://docs.python.org/3/

OpenCv Documentation : https://docs.opencv.org/3.0-beta/doc/py_tutorials/py_tutorials.html

Head Movement Tracking :
https://github.com/manikantanallagatla/Head-Motion-Detection-and-Tracking/tree/master/head-motion-tracking-master