PROJECT SYNOPSIS

ON

ASSITANT FOR PWD

MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY

(formerly known as WBUT)

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OBJECTIVE:

According to Cambridge English Dictionary,

The action of helping someone by sharing work.

By convention when we think about the word “assistance” we generally think about a human being.

But in the era of IT industry this convention should move to an automated robot which can do the same but in some case better than a human being.

Our idea is to make an ***automated robot to help the persons who are physically incapable*** to do their daily stuff to some extent.

Suppose a blind person is incapable to find something which is laying around their floor. Our **BOT** will **find that item**, **pick it**, and **take it to the person**.

INTRODUCTION

The key software implementation behind this project is

Real Time Image Processing using OPENCV in Python environment

- **What is Image Processing?**

Image processing is a method to perform some operations on an **image**, in order to get an enhanced **image** or to extract some **useful information** from it. It is a type of **signal processing** in which input is an **image** and output may be **image** or characteristics/features associated with that **image**

- **What is OpenCV?**

OpenCV (Open source computer vision) is a **library** of programming functions **mainly aimed at real-time computer vision**. Originally developed by **Intel**, it was later supported by Willow Garage then Itseez (which was later acquired by Intel). **The library is cross-platform** and free for use under the open-source BSD license.

PROPOSED WORK

At *Conventional image processing* the steps are stated here:

But as we are using **Raspberry PI 3** with low computation power we cannot train our model with different image stream or video as in *TENSORFLOW*

So we are using ***Pre-Trained model*** for our image process.

- At first we will get the information from the user about the color and name of the object.
- Then the robot will start rotating 360° to search for the object.
- Then we will spontaneously get the frame from the camera and feed this to our algorithm.
- Then the frame is changed from RGB to pre-defined HSV value according to the object color to remove the background.
- Then the image is fed to the pre-trained model to identify the object if that matches with the user query.
- If everything matches then the bot will stop rotating and set itself to a position where contour of the object is about in the middle of a virtual vertical line.
- Then the robot will start moving forward, towards the object keeping the object in middle of each frame.
- When the contour will occupy the whole frame then it should go further a small distance and start to close the jaw.
- After closing the jaw the bot will pick the object and start the same procedure for finding the owner in the room.
- Then it will proceed to the owner and hand over the object to him or her.
- Hence the job is completed.

FUTURE SCOPE /LIMIT

- Now a day's assistance is not that much trustworthy so we are developing this robot.
- As we all know robot are much more efficient and can do the same work for longer period of time without being bored.
- Hiring a personal assistant is not cost-effective but in our case it will take a one time investment.
- The bot can be activated through the voice app, so it will be handy for the incapable ones.

SOFTWARE REQUIREMENTS

- There is nothing special needed for this project. Customer should have an AC power supply to charge the battery of the robot as this is battery operated.
- For the voice command, strong internet connectivity is required.
- Minimum light in the room is mandatory, as we are optical sensor rather than an IR sensor.
- For development we need a System having minimum Windows 7(or higher), 4GB Ram, 320 GB HDD, webcam (5MP-30FPS), python 3.7 and OpenCV installed.

HARDWARE COMPONENTS

- ❑ Raspberry PI 3
- ❑ Raspbian OS
- ❑ PI camera (5MP 30 FPS)
- ❑ 12 volt 300 RPM motor (4 pc) and wheels
- ❑ 14.8 volt 5000 mAh Li-Po battery and charger
- ❑ Readymade picking module
- ❑ L293D motor driver
- ❑ LM2956 Buck converter (DC to DC Converter)
- ❑ Wires
- ❑ Soldering station

CONCLUSION

After considering the entire factor we think this project is very much possible to implement and make it successful. As now a days it is becoming very much common in our country that it lead to a problem whenever an unknown assistant is assigned with them who are needed them most. We believe this will lead to a perfect solution to this problem.

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