

The VisionX - Product Information

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Note: This text was written completely by Shyam and Sashwath, and looks like it was written by AI only because of the formatting.

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Problem Statement:

UNSDG GOAL - QUALITY EDUCATION FOR ALL

People with disabilities, specifically those with visual impairment, autism and dyslexia face problems while learning. Most educational materials aren't made for children with these disabilities.

Problems Faced By The Visually Impaired:

Braille text is not available everywhere, which not only deprives the blind of learning opportunities, but makes it harder for them to navigate through their surroundings as well. Braille textbooks are expensive, which is another problem. To integrate blind people into society, they should be empowered to read from normal textbooks.

Also, since they are blind, they face difficulty in everyday life, while perceiving the world around them, in the form of objects, text, images and also just moving around in general.

Features:

This product has multiple features which makes it adaptable for many people in different situations.

It's not just for blind people, it's also for people on the spectrum, like people with dyslexia. Dyslexic people do not process words and sentences the same way normal people do. Hence, our product would help them greatly. It is to note that this doesn't just read text, but explains the text in a descriptive and understandable manner to help users visualise.

Our product is multilingual- It supports text of multiple languages and translates it into an English explanation. This brings forward a new use- for people in foreign countries.

Another point which is of importance, is that it can be used to navigate. If a scan of a room is taken, a detailed, descriptive audio explanation is given, which helps the user visualise their surroundings, which ultimately allows them to navigate better.

The product has a wide-angle camera, which allows the camera to recognise text on a wide range, opening the door to a variety of learning opportunities. This efficiently integrates our users into society.

Also, the product's audio can be connected to a variety of bluetooth devices

Future Enhancements :

All great machines have room for improvement. Nothing is without its faults. Our team has high hopes for VisionX and has multiple enhancements in mind.

Currently VisionX is made for individual usage, with time we will soon be able to implement this ground breaking technology in classrooms, libraries, restaurants and office work spaces.

VisionX is a relatively small box, our team wants to reduce the size even more. By reducing the size, it is possible that we could implement it into glasses and walking sticks.

At the present VisionX can only capture still images, with the addition of video technology the device will be able to process and understand videos too. This will allow the user to understand the layout of a video space and area even better. This would also require python OpenCV, but it is much more advanced technology, and is seen in the reverse cameras in cars.

Hardware:

The hardware of the device comprises of 3 main components,

1. Raspberry Pi
2. PiCamera Module
3. Button
4. Power Source

The Raspberry Pi is the heart of the device, and holds all the software and python code. Once the button is pressed, it starts a series of actions, and the camera captures a picture, which is then processed by the model. To power the RaspberryPi we used a portable and rechargeable power source.

3D-design:

The outer covering of our product was designed using Tinkercad, a software used to create 3D designs. The device was made so that it is portable, it can be secured using a snap-fit joint. We then sent it to a 3D printing company and got it printed in a way that the case holds all the hardware.

Software:

This was the strenuous stage of the building process. The raspberry pi supports multiple languages, and we used python and windows terminal for commands. Using python (openCV library), we made a programme that was linked with the OpenAI GPT 4o API. Once the button was clicked, an image was saved in the storage unit of the RaspberryPi, from there the path of the image was sent to the model, which was then prompted to explain the contents of the image in a descriptive way, thereby enabling the user.

Solution:

Our novel product would help millions of visually impaired and dyslexic people to learn the same things as those without disabilities, without the hassle of reading braille. Our project scans text on paper or the surrounding areas, objects and images and uses

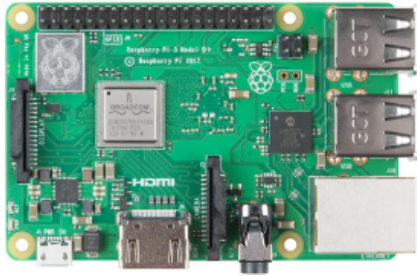
OpenAI GPT 4o's API to explain in detail what it has scanned through an audio source, all with just a press of a button. This device is easy to carry and use, helps the blind to easily navigate through the challenges of text in paper.

Gallery:



- 3d Print along with Battery Source





Raspberry Pi, a key component of the product



3d design for the product



Hardware, along with camera and wired button

Video of the product:  VisionX_video.mp4