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Problem Statement-4:

Detection of Authenticity of Currency Notes for visually impaired people

Team Members

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Abstract

Visually impaired people often face difficulty to identify a nominal currency note . Indian currency notes are available in different sizes and colours with tactile qualities that enable the visually impaired to identify different currency notes, but these tactile makers are worn out with usage.
So, to overcome this problem we have designed an Indian currency identifier (DETECTO) that will help visually impaired and blind people to identify authentic Indian banknotes easily in less time using a UV ray detecting sensor, colour sensor and sound module that will give output in audio form.

Background on the Problem Statement

Globally, an estimated 253 million people are visually impaired, with India being home to a significant portion of this population. In India, more than 12 million individuals face the daily challenge of identifying currency notes independently. This problem not only affects their financial autonomy but also hinders their participation in economic activities. Our project aims to bridge this accessibility gap by creating a solution tailored to the unique needs of the visually impaired community.

EXISTING SOLUTION

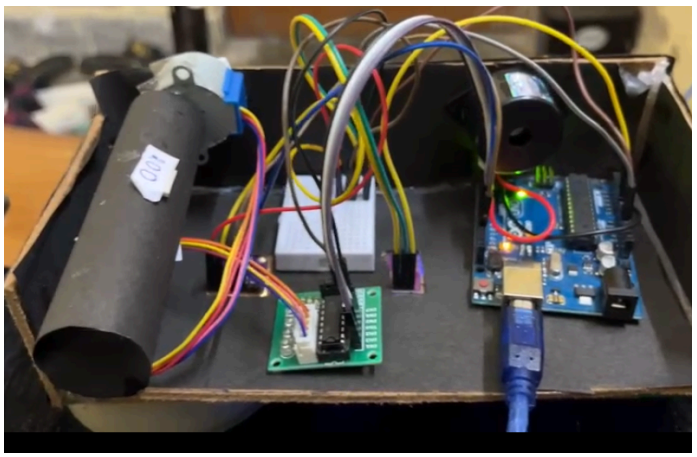
1) There are tactile markers present on the currency notes which enable visually impaired people to identify the denominations . However it lacks reliability and accessibility
2) Counterfeit Bank Note detection machine which uses UV light but it is not meant for visually impaired people
3) Devices are used by banks to identify fake currency but they use advanced technology which cannot be used by common people . Also those device are not easy to carry and are also not meant for visually impaired people

Our Solution

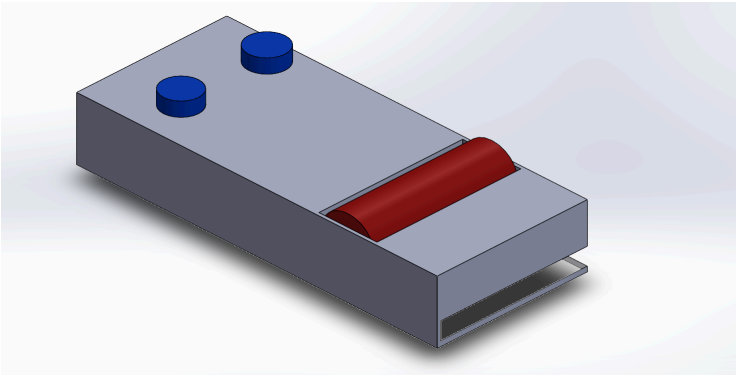
Our innovative currency recognition device harnesses cutting-edge technology to empower visually impaired individuals in India and beyond. By leveraging the distinct property of real Indian currency notes to absorb UV light, as opposed to counterfeit notes that transmit UV light, we have designed a system that places a currency note between a UV light source and a UV sensor. The UV sensor reads the response, which is then processed by an Arduino microcontroller.

In addition, we employ a colour sensor to identify the note's valuation. This dual-sensor approach ensures high accuracy in currency recognition. The UV property check enhances security against counterfeit notes, while the colour sensor precisely determines the denomination, providing a comprehensive solution that is reliable, efficient, and user-friendly.

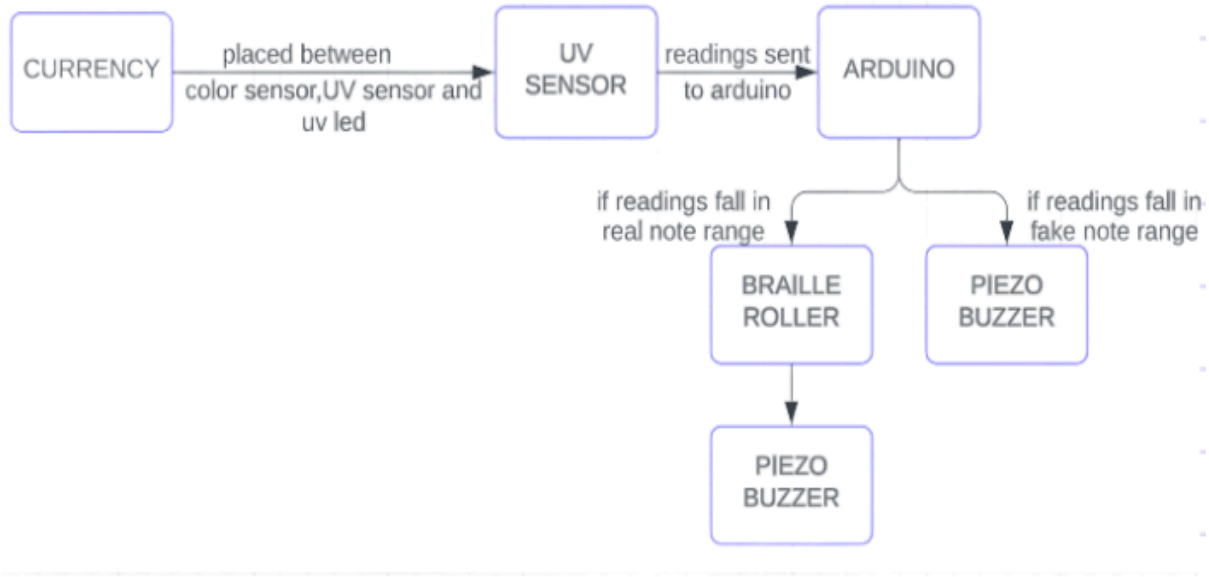
Our Device



CAD MODEL OF OUR DEVICE



Working of our solution



- User switches on our device and places currency note in the slit
- UV Sensor placed below the note detects intensity of UV light placed above the note
- Reading of UV Sensor is sent to arduino for comparison with pre stored data
- The valuation of note is tested by detecting the colour of note using a colour sensor
- If readings fall in fake note range then it alerts with the help of piezo buzzer
- Else the braille roller rotates to tell the user about the value of note and the speaker also validates the authenticity of note

WORK DONE ON USER TESTING

We engaged in a productive dialogue with end users to gain a deeper understanding of the genuine challenges faced by individuals with visual impairments when it comes to identifying currency notes. In response to their valuable input, our team focused on crafting a solution that is not only cost effective but also user friendly.

Our device boasts a seamless start-to-finish process, offering automatic authentication of currency notes based solely on distinctive features that counterfeit notes lack. This means that individuals who are blind can simply insert a note and power on the device without any added concerns. Furthermore, upon successful verification of an authentic note, the device emits an audible buzzer signal,ensuring accessibility, and activates the braille roller for tactile confirmation.

SALIENT FEATURE OF OUR DEVICE / NOVELTY

1) **EASY TO HANDLE** : The device is convenient to carry and can be easily used by visually impaired people due to its simple structure
2) **PROPER FEEDBACK MECHANISM** : Feedback of the authenticity of the note is given with the help piezo buzzer and braille roller
3) **ACCURACY :** The result will not rely completely on single feature rather it uses two sensors UV Sensor and Colour Sensor for checking the authenticity of the note , hence the accuracy of the product increases.

CONCLUSION

In conclusion, the development and deployment of our counterfeit currency detection system utilising an Arduino Uno, UV sensor, and colour sensor has proven to be a resounding success. Through meticulous planning, careful selection of components, and systematic programming, we have achieved a reliable and efficient solution to address a critical issue in the realm of financial security.

REFERENCES

https://www.hyundaimib.com/tech-guide/sensors/