

Detection Of Currency Notes for Blind

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Abstract: Currency is basic need for everyone and its recognition is a simple and straightforward task for normal human beings, but if we consider the visually challenged people currency recognition is a quite a challenging task even if there are some engraved markings on side of the notes. So to recognize a currency note the person must learn to interpret the cues to differentiate the denominations of the currency. Even the use of digital currencies are increasing rapidly physical notes can be the best and easy option for blind in their daily basis. This brings to the need for currency recognition systems. More than this the life the blind people lead must be as independent as possible.

Keywords: Embedded systems, Visually disabled Raspberry Pi, Currency recognition, Currency denomination, Image processing, Image comparison, Machine learning, Image capturing .

I. INTRODUCTION

The Research work in the banking Sector is evolving exponentially. This modern technology world has wide requirement of currency recognition system. It can be used for assisting blind people, monitoring currency system, currency exchanges etc. According to the statistics India is a home to 9.3 million visually impaired and 2,70,000 bling children, with more than 25% of that figure are not preventable or treatable. One of the main problems resist by people with visual impaired is the incapacity to identify the paper currencies due to the approximation of paper texture and size between the different currencies So, there is a need to design a system that detects the denomination of currencies and in easy way.

II. OBJECTIVE

The main objective of this project is to build a system which detects currency notes denominations using Machine learning, Train the system to give accuracy as high as possible. By this blind people can know the currency notes they are holding with ease. And also, the system must be portable easily.

III. LITERATURE SURVEY

According to research [1], the author proposed an Android paper currency recognition system that applied to Saudi Arabian papers. Recognizing paper currency methods that relies on some features and correlations between two currency Images. Defined an efficient and fast algorithm for differentiating multiple national bank currencies depends on size information and correlation matching of multiple templates. As different bank currencies have different sizes so this information was regarded to be a vital feature. This method was tested using 55 currencies of 30 different classes from five countries like EUR, RUB, USD.so, results of this method is 100%.

In [2], the author recognizes and classifies four different kinds of currencies through computer vision. The typical Accuracy rate was 93.84%.

According to research in [3], authors have introduced an unsupervised algorithm for segmentation of synthetic aperture radar images which is rely on fuzzy clustering approach to beat the high time complexity of rich-performance clustering algorithms which analyse all pixels for image segmentation. Their algorithm selects a subset of key pixels supported by the rule of local extrema and performs segmentation on those.

The analysis in [4] gives a dataset for the evaluation of change point detection algorithms which consist of 37 time series from different domains. By analysing the consistency of human annotations, the dataset describes evaluation metrics for measuring the performance of algorithms.

Research in [5] proposes a system for recognizing fake currency notes of Indian currency. The system verifies the real images on the premise of image processing by extraction of security measures of Indian currency notes.

IV. IMPLEMENTATION

The Raspberry Pi is a series of credit card-sized single-board computers developed in England, and the camera consists of a small (25mm by 20mm by 9mm) circuit board, which connects to the Raspberry Pi's Camera . This model has two phases ,hardware phase and software phase .

In software phase a programming language is selected and training of dataset is done. When the code is ready it is dumped into the raspberry pi memory . In hardware phase the camera and speakers are interfaced with raspberry pi . When inputs are given , as the code contains all the instructions and commands for all the components in the circuit output will be generated as required.

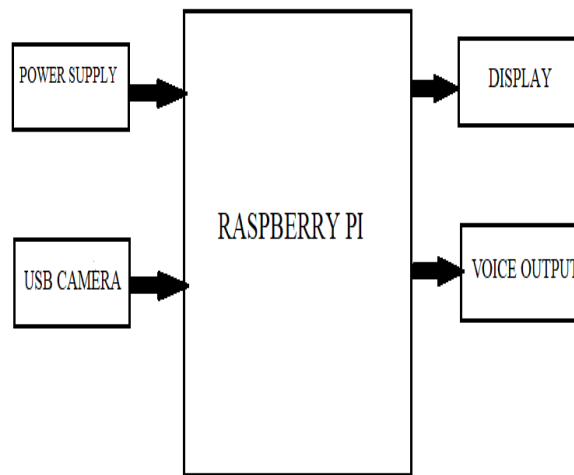


Fig 1: Block Diagram
V. RESULT



Fig 2: Top View of Proposed Prototype

Our system deals with the common aiming problem for blind people. This proposed hardware model that recognizes the Indian currency uses CNN algorithm. We here develop a portable currency notes detector which can easily used by blind people.

CONCLUSION

The developed model detects the denomination of India currency with the help of basic CNN algorithm. The developed product is a Multi-Purpose Module and can be implemented in Real Time Applications such as automating vending machines, automatic ticket counters etc. Finally, in this project, to deal with the common problem for blind users, we have proposed a hardware model for currency recognition that recognizes Indian currency to help blind persons in their daily lives. Considers offline captured images while the Android one was designed to match visual impaired users.






FUTURE SCOPE

This type of recognition systems are not only limited to currency detection. The system's application can be further extended to detecting of medicine for blind people. Also, these can be implemented in real-time applications like automatic vending machines, ticket counters etc., but their accuracy must be increased. These systems can be used to detect other daily life objects but they require more complex working algorithms for their implementation.

REFERENCES

1. Sarfraz, et al. "An intelligent paper currency recognition system." *Procedia Computer Science Journal*, Vol. 65, pp. 538-545, 2015.
2. Jyothi, Ch Ratna, Y. K. Sundara Krishna, and V. Srinivasa Rao. "Paper currency recognition for colour images based on Artificial Neural Network." In *Electrical, Electronics, and Optimization Techniques (ICEEOT)*, International Conference on, pp. 3402-3406. IEEE, 2016.
3. Ronghua Shang, Yijing Yuan, Licheng Jiao, Biao Hou, Amir M. Ghalamzan E, and Rustam Stolkin - "A Fast Algorithm for SAR Image segmentation Based on Key Pixels -Oct 2017"
4. Gerrit J. J. van den Burg, Christopher K. I. Williams - "An Evaluation of Change Point Detection Algorithms - May 2020"
5. Anwar Wanjara, Priyanka Satija, Nikita Patil, Samiksha Chindhalore, Shubham Gaulkar, Prof. A. D. Gotmare - "Counterfeit Currency Detection System"
6. Xiaole Zhanga, Yuying Shi a, Zhi-Feng Pangb, Yonggui Zhu - "Fast algorithm for image denoising with different boundary conditions"
7. Zeggeye J.F., Assabie Y. Automatic recognition and counterfeit detection of Ethiopian paper currency. *Int.J. Image Graph. Signal Process.*
8. Doush, Iyad Abu., et al. "Currency recognition using a smartphone: Comparison between color SIFT and gray scale SIFT"

algorithms." Journal of King Saud University-Computer and Information Sciences 29.4 pp. 484-492 , 2017.

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