Literature Survey for BlindScan

Globally, the World Health Organization estimates that approximately <u>285 million people</u> are visually impaired, of which 39 million are blind. In India alone, the visually impaired population exceeds <u>15 million</u>, making it one of the countries with a significant number of individuals facing visual challenges. These people often encounter obstacles in managing financial transactions independently, primarily due to the inability to distinguish between different denominations of currency notes.

The Government of India has provided extra features such as extra dots in braille to identify the lines on the side. But because most notes are handled very frequently and kept in wallets, the braille content is pressed down and it does not help the blind anymore.

The visually impaired have to frequently rely on others to identify currency notes for them, posing risks of financial exploitation and errors. Moreover, the tactile features of various currencies, including Indian rupees, can be subtle and difficult to identify, especially for those not accustomed to them or when the notes are worn.

An application capable of recognizing Indian currency notes using image processing techniques addresses these challenges head-on. By leveraging technology like the convolutional neural networks, such a system can significantly enhance the financial independence of visually impaired individuals. It provides a reliable, discreet, and user-friendly means to identify currency denominations, empowering them to conduct transactions with confidence and security.

In summary, the need for technological solutions to aid the visually impaired in currency recognition is not just a matter of convenience but a fundamental issue of accessibility and empowerment. By integrating advancements in image processing and object detection algorithms, applications designed for currency recognition can play a pivotal role in bridging the gap between visual impairments and financial independence.

1. Title: Analysis of Banknote Authentication System using Machine Learning Techniques   [Link]
  - *Authors:*
        S. Anandhakumar, S. Sivakumari
  - *Findings:*
        This research explores the use of *machine learning techniques* for banknote authentication. The study focuses on feature extraction and classification methods to distinguish genuine and counterfeit banknotes. Various algorithms, including **Support Vector Machines (SVM) and k-nearest Neighbors (k-NN)**, were applied.

- Conclusion:

The paper *concludes that machine learning techniques are effective* for banknote authentication, providing insights into the potential application of similar approaches in currency identification for visually impaired individuals.

2. Title: Currency Detector for Visually Impaired: Study of the System Which Identifies Indian Currency for Blind People [Link]

- Authors:

S. Yadav, Z. A. Ansari, K. G. Singh

- Findings:

This research presents a system aimed at recognizing Indian currency notes to aid visually impaired individuals, utilizing advanced image processing for **feature analysis based on color and texture.** Central to this system is the implementation of the ***YOLOV3 algorithm***, combined with **RGB image format processing**, to accurately identify various denominations of currency. Despite its innovative approach and real-time detection capabilities, a notable limitation of this method lies in *its reliance on high-quality images* for accurate recognition. This requirement could pose challenges in low-light conditions or with notes of poor quality, potentially affecting the system's overall effectiveness in practical scenarios.

- Conclusion:

This study, therefore, highlights both the potential and the constraints of leveraging YOLOV3 and RGB analysis for enhancing financial accessibility for the visually impaired.

3. Title: Vision-Based System for Banknote Recognition Using Machine Learning Approach [Link]

- Authors:

Nur Rahmad, et al.

- Findings:

The paper presents a vision-based system for banknote recognition **utilising a machine learning** approach. The study employs ***Convolutional Neural Networks (CNNs) for feature extraction*** and classification. The focus is on achieving robust recognition performance across various banknote denominations.

- Conclusion:

The research concludes that ***CNNs are effective for banknote recognition***, emphasizing their potential application in systems catering to the visually impaired by providing a reliable means of currency identification.

4. Title: Mobile Aided Note Identifier (MANI, App by RBI) [Link]

- Developed by:

Reserve Bank of India

- Findings:

The MANI app by RBI, intended to help visually impaired individuals identify currency denominations, has faced criticism for its practicality and accuracy. Users and disability

rights activists have reported that the app is slow, often inaccurate, and could compromise privacy by requiring users to publicly scan their cash.

- *Conclusion:*

The MANI app, developed by the RBI to assist visually impaired individuals in identifying currency notes, has faced significant challenges. Criticisms include its slow response, inaccuracy, and privacy concerns, highlighting the need for more effective solutions. Despite its intent to enhance financial accessibility, the app's shortcomings underscore the importance of designing more user-friendly and reliable tools for the visually impaired community.

These research papers collectively highlight the potential of machine learning, image processing, and neural network approaches for currency recognition systems, offering valuable insights for the development of a Currency Note Identifier for visually impaired individuals.