

# MONEY RECOGNITION AND FAKE CURRENCY DETECTION FOR VISUALLY IMPAIRMENT PEOPLES

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## ABSTRACT

Modern automation systems in real world require a system for currency recognition. It has various potential applications including banknote counting machines, money exchange machines, electronic banking, currency monitoring systems, assist blind person etc. The recognition of currency is a very important need for Blind and visually impaired people. In this project, we present a simple system currency recognition system applied on Indian banknote. The presents a banknote fitness determination method which mainly focuses on soil and stain detection using images scanned with contact image sensors (CIS). Difference images between fit and unfit banknotes may be used to determine fitness. However, these images may contain erroneous edges since the CIS images usually have some alignment errors caused by scanning, printing, and cutting operations. To resolve this problem, we first categorized the soiling patterns into two types: large- and small-scale. Then we used two different morphological-based methods to eliminate the false edges by security features.

## KEYWORDS

Image processing, image classification, morphological operations, machine learning.

## INTRODUCTION

Maintaining public confidence in currencies is one of the most important tasks for central banks. Since unfit banknote circulation may negatively affect public confidence, most central banks have set up their own standards for fitness requirements to ensure the integrity and preservation of their currencies. For instance, the European Central Bank (ECB) has adopted minimum standards for euro banknotes, which include several criteria for fitness sorting [20] such as soiling, stains, graffiti, tears, holes, etc. Soiling is mainly caused by aged human sebum and this is considered as one of the main reasons for banknote deterioration

[1], [2], [9]. To meet the standards, banknote handling machines have been designed to automatically detect unfit notes. Such machines usually have chargecoupled device (CCD) based image sensors with various wavelengths and thickness detection modules to detect unfit banknotes.

## EXISTING SYSTEM

Banknote recognition means classifying the currency (coin and paper) to the correct class. In existing system developed a dataset. After that applied automatic recognition system using on the dataset using scale-invariant feature transform (SIFT) algorithm. This is the first attempt, to the best of the authors knowledge, to recognize both coins and paper banknotes on a smartphone using SIFT algorithm. SIFT has been developed to be the most robust and efficient local invariant feature descriptor. Color provides significant information and important values in the object description process and matching tasks. Many objects cannot be classified correctly without their color features. To make the recognition task easier, we apply four morphological transformations to the binary images. Morphological transformations extract and alter the structure of particles in an image. We applied four binary processing functions erosion, dilation, opening and closing to remove noise. Feature

extraction or selection is a pivotal procedure considerably for currency recognition, which effects on design and performance of the classifier intensively. If the differences of selected features are so large, it can easily construct a classifier with good recognition performance. It is difficult to get it with the contrary situation. The essential task of feature extraction and selection is how to find the correspondingly effective features out of many pending features. And Global transformation technique transforms the pixel representation to a more compact form. This reduces the dimensionality of the feature vector and provides feature invariants to global deformation like translation, dilation and rotation.

## DISADVANTAGES

- Accuracy is less
- Irrelevant features extracted
- Automated segmentation can be needed
- Difficult to identify the fake notes
- Not implement in real time environments.

## PROPOSED SYSTEM

Visually impaired people faced a problem in identifying and recognizing the different types of banknote due to some reasons. This problem

draws researchers' attention to introduce an automated banknote recognition system that can be divided into a vision-based system and sensor-based system. In proposed system, we can implement vision based system to recognize the bank note using machine learning techniques. Automatic recognition of Indian currency is very important in major domains like banking nowadays.

After image binarization, the digits on the serial numbers of the banknotes often have some discontinuous particles, some further noise and some unexpected edges. To make the recognition task easier, we apply active contour method to the binary images. Contour method is used to extract and alter the structure of particles in an image. After that extract the features and it describes geometrical and topological characteristics of a pattern by representing its global and local properties. Statistical features are derived from the statistical distribution of pixels and describe the characteristic measurements of the pattern. Finally implemented Convolutional neural network algorithm to classify the notes and provide the fake currency alert. This system is used to detect

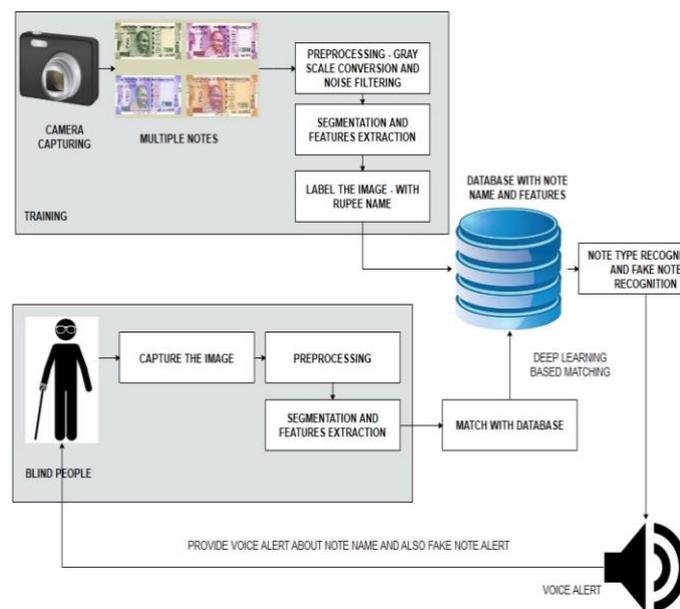
whether the currency is fake or original through the auto mated system which is through convolution neural network, in deep learning. Deep learning excels in the task of recognition and classification of images over large data sets, which is also primarily used in object category recognition. In the recent

demonetization drive may be a step towards eradication of corruption and black money, but it fails to address the problem of counterfeit currency.

**ADVANTAGES**

- Real time implementation
- Accuracy is high
- Parallel processing in bank note recognition
- Automated approach in contour detection of currency

**SYSTEM ARCHITECTURE**



**Concurrency and locking:**

SQL Server allows multiple clients to use the same database concurrently. As such, it needs to control concurrent access to shared data, to ensure data integrity. When multiple clients update the same data, or clients attempt to read data that is in the process of being changed by

another client. SQL Server provides two modes of concurrency control: pessimistic concurrency and optimistic concurrency. When pessimistic concurrency control is being used, SQL Server controls concurrent access by using locks. Locks can be either shared or exclusive. Exclusive lock grants the user exclusive access to the data no other user can access the data as long as the lock is held. Shared locks are used when some data is being read multiple users can read from data locked with a shared lock, but not acquire an exclusive lock. The latter would have to wait for all shared locks to be released. Locks can be applied on different levels of granularity on entire tables, pages, or even on a per-row basis on tables. For indexes, it can either be on the entire index or on index leaves. The level of granularity to be used is defined on a per-database basis by the database administrator. While a finegrained locking system allows more users to use the table or index simultaneously, it requires more resources, so it does not automatically yield higher performance. SQL Server also includes two more lightweight mutual exclusion solutions latches and spinlocks. which are less robust than locks but are less resource intensive. SQL Server uses them for DMVs and other resources that are usually not busy.

**The most critical parts of SQL Server  
8 are:**

- SQL Server is anything but difficult to utilize.
- SQL Server scales from a portable tablet to symmetric multiprocessor frameworks.
- SQL Server gives information warehousing elements that as of recently have just been accessible in Oracle and other more costly DBMSs.

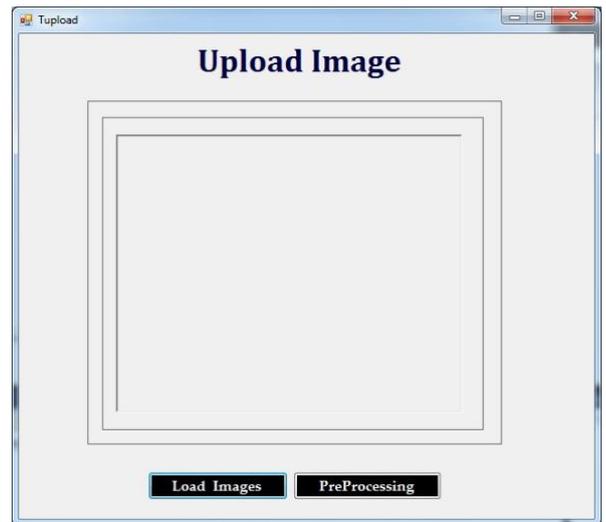
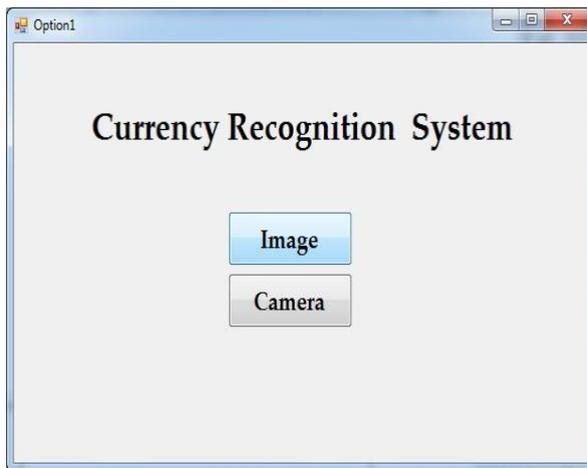
A database framework is a general gathering of distinctive database programming segments and databases containing the parts viz. Database application projects, Front-End segments, Database administration frameworks, and Databases.

**○ A database framework must give the accompanying elements:**

- A mixture of client interfaces
- Physical information autonomy

- Logical information autonomy
- Query advancement
- Data honesty
- Concurrency control
- Backup and recuperation
- Security and approval

SQL Server is a Relational Database Management System. The SQL Server social dialect is called TransactSQL. SQL is resource arranged dialect.



**Future enhancement**

In future we can extend the framework to implement various algorithms to improve the accuracy for different countries and embed this system with sensors and also mobile applications.

**CONCLUSION**

Automated paper currency recognition system can be a very good utility in banking systems and other field of commerce. Automatic currency note recognition invariably depends on the currency note characteristics of a particular country and the extraction of features directly affects the recognition ability. We have presented a comprehensive overview of techniques for the recognizing currency using neural network techniques. Nonetheless, we have surveyed and classified a

significant fraction of the proposed approaches, taking into consideration the techniques they utilize, methodology they propose and the currency they have been applied to and the accuracy of recognition. In our opinion, this survey has shown that a significant number of neural network techniques exist for the problem of currency recognition, but it has also shown that the researchers have worked on currency of Indian country. We believe that the field will be significantly enriched if methods from these sources are incorporated into efficient recognition of Indian currency with the features mentioned in our study.

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