Fake Currency Detection System Using Deep Learning

D Tejaswini , B Akshitha , Ch Dharani

Under the esteemed guidance of

Mr.A Rajashekar Reddy

Assistant Professor

Bachelor of Technology

Department of Information Technology

BVRIT HYDERABAD college of engineering for Women

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Overview

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Introduction

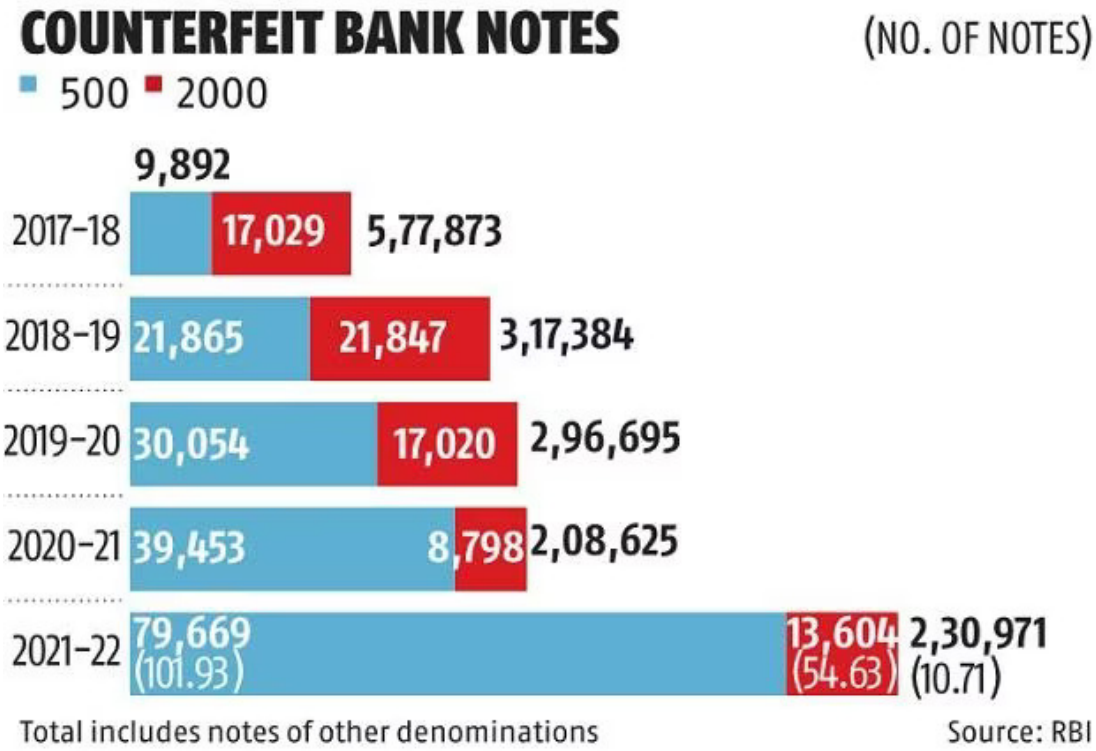
- Counterfeiting money stands for illegal replication of original currency,hence counterfeit currency is termed as fake currency that has not been authorised by government.
- Fake currency is produced using techniques like offset printing and digital printing, These when circulated causes significant threat to economy.

Table VIII.9: Denomination-wise Counterfeit Notes Detected in the Banking System (April to March)

(Number of pieces)

Denomination (₹)	2020-21	2021-22	2022-23
1	2	3	4
2 and 5	9	1	3
10	304	354	313
20	267	311	337
50	24,802	17,696	17,755
100	1,10,736	92,237	78,699
200	24,245	27,074	27,258
500 (Specified Banknotes)	9	14	6
500	39,453	79,669	91,110
1000 (Specified Banknotes)	2	11	482
2000	8,798	13,604	9,806
Total	**2,08,625**	**2,30,971**	**2,25,769**

Source: RBI.


COUNTERFEIT BANK NOTES
(NO. OF NOTES)
500
2000
2017-18
9,892
17,029
5,77,873
2018-19
21,865
21,847
3,17,384
2019-20
30,054
17,020
2,96,695
2020-21
39,453
8,798
2,08,625
2021-22
79,669
(101.93)
13,604
(54.63)
2,30,971
(10.71)
Total includes notes of other denominations
Source: RBI

Literature Survey

SNo	Title	Author	Algorithm used	Year
1	Fake Currency Detection with Machine Learning Algorithm and Image Processing	Aman Bhatia ,Anshul Shroff, Mayand Kumar, Vansh Kedia, Mayand Kumar	K-Nearest Neighbours followed by image processing	2022
2	Fake currency detection using Image processing	L. Latha, B.Raajshree, D. Nivetha	OpenCV and ML algorthims for feature extraction	2021

SNo	Title	Author	Algorithm used	Year
3	A Hybrid Fake Banknote Detection Model using OCR, Face Recognition and Hough Features	Adiba Zarin, Jia Uddin	Optical Character recognition (OCR), Face Recognition and Hough transformation algorithm	2019

Problem Statement

- Fake currency detection is a process of identifying counterfeit or unauthorised banknotes.
- Even if banks and other big organizations have automatic machines designed to identify counterfeit currency notes, ordinary people can hardly differentiate between them.
- To overcome fake currency detection system is proposed which is accessed for every individual.

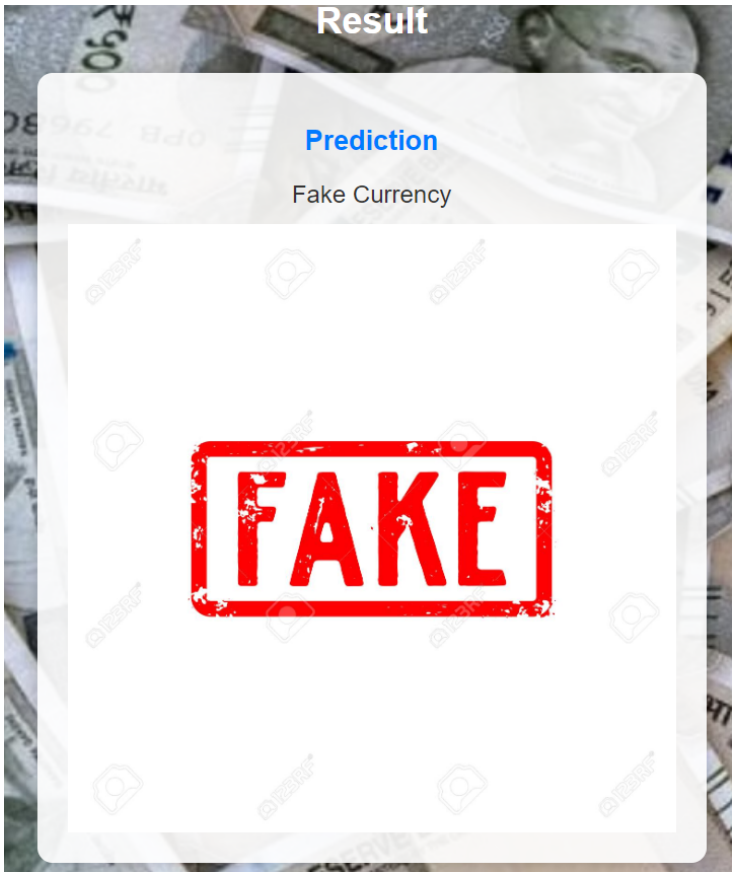
Proposed Method

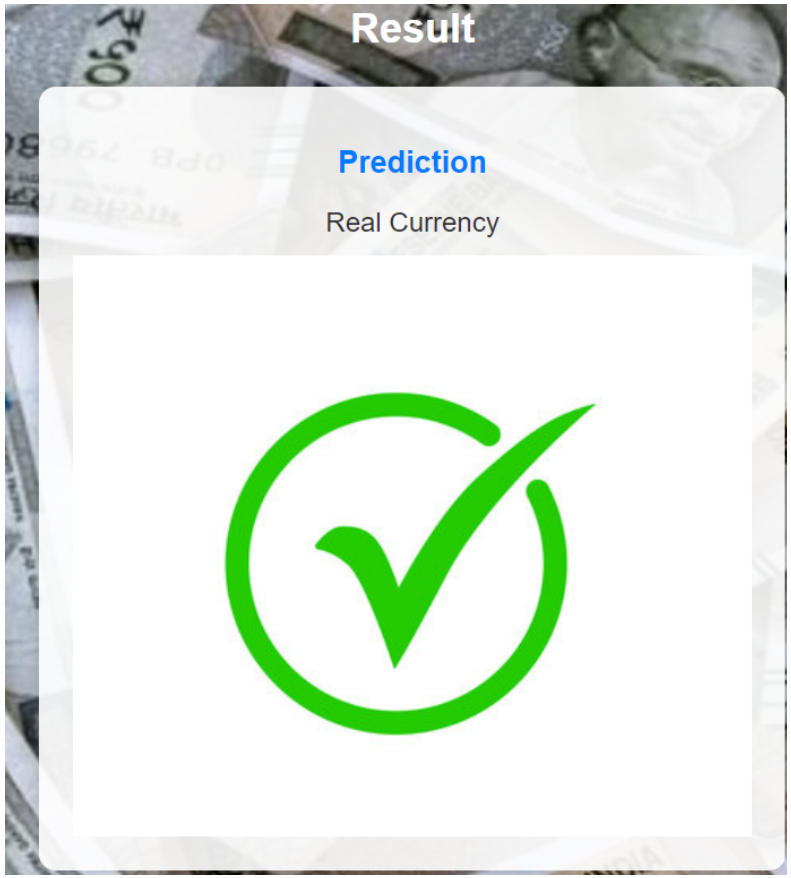
- Most of existing methods are implemented based on hardware and image processing techniques which results in slow detection of counterfeit currency.
- To improve this we propose a system that is developed based on convolution neural network(CNN) which results in minimal complexity and no human intervention.

Implementation

- Collection and analyzing of genuine and counterfeit currency images.
- Preprocessed images by standardizing size and normalizing pixel values.
- Developing CNN model and training the model with data set consisting of genuine and counterfeit currency images.
- Evaluated performance of model and accuracy.
- Interface is developed for user convenience and prediction result of model is displayed as output.

Results


Result
Prediction
Fake Currency
FAKE


Result
Prediction
Real Currency

Conclusion & Future Scope

- Successfully classifies genuine and counterfeit currency.
- Enhanced security with model improvements: Incorporate additional security features in the design of future banknotes along with regular model updates and improvements in model and data set.

Thank you