

INDIAN CURRENCY CLASSIFIER USING DEEP LEARNING

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ABSTRACT

Indian currency plays a major role in Indian economics. However this paper proposes a deep learning method for image processing to identify the currency. This model is trained with the help of currency image dataset for accurate prediction. This system reduces the need for manual intervention which leads to increased efficiency and cost savings. The dataset comprise of Indian currency images plays a key role in training the model with the help of Deep learning algorithm. This is mainly useful in the Banks and ATM for recognizing the currency where speed plays a crucial role



INTRODUCTION

India, as one of the developing country occupies a pivotal position in the financial level across the globe. The accurate classification of currency notes is a critical requirement in various financial and commercial sectors. In India, where a diverse array of currency denominations circulates, ensuring the authenticity and correct identification of currency notes is essential for seamless financial transactions and fraud prevention. The main aim of this project is to develop the Indian currency classifier using the convolutional neural networks algorithm which comes under Deep learning technique to accurately identify the different denominations of Indian currency notes.

LITERATURE REVIEW

S.no	Name	Author	Year
1.	Indian Currency Recognition using Image Processing	A. Kumar, S. Singh	2018
2.	Currency Recognition System using Image Processing and Neural Network	P. Verma, R. Gupta	2019
3.	Automated Indian Currency Detection and Recognition	M. Sharma, N. Patel	2020
4.	Machine Learning Based Indian Currency Detection	S. Rao, V. Iyer	2021
5.	Currency Recognition using Convolutional Neural Networks	A. Mehta, K. Agarwal	2020

LITERATURE REVIEW

S.no	Name	Authors	Year
6.	Indian Currency Detection using Machine Vision	N. Reddy, P. Bose	2019
7.	Real-Time Indian Currency Recognition System	K. Das, S. Roy	2020
8.	Deep Learning Approach for Indian Currency Classification	T. Khan, R. Sinha	2022
9.	Computer Vision Techniques for Indian Currency Recognition	L. Gupta, S. Desai	2022
10.	Indian Currency Classification using SVM	J. Bhatt, A. Rao	2023

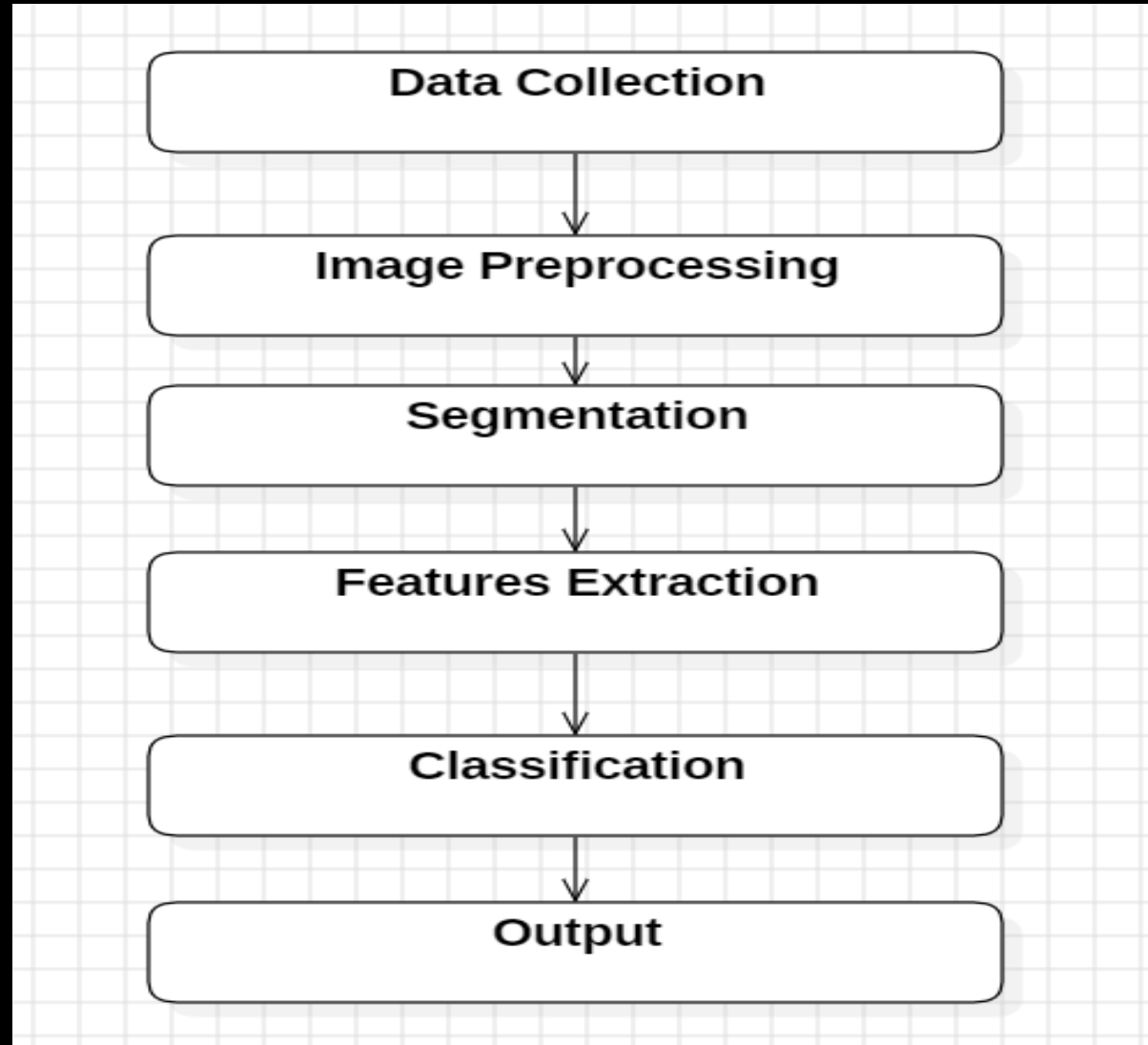
EXISTING SYSTEM

Indian currency denomination recognition based on ANN algorithm proposed that different Indian currencies are classified based on the set of features like colour and dimensions. The classification of shapes is achieved with the help of ANN algorithm with 90% of accuracy. One of the main limitation of this paper is that the background of the image is contrasting with the object which affects the accuracy. Also the dataset contains 5 different classes of Indian currency.

PROPOSED SYSTEM

Our proposed solution provides a easy method which reduces the need for manual intervention that leads to increased efficiency and cost savings. This system used CNN algorithm to predict the images of Indian currency with 95% of accuracy. The dataset consist of 7 different classes of Indian currency. The main purpose of using CNN algorithm is as it includes pooling layer which reduces the spatial dimensions so that our model can predict the image regardless of the location of the images.

SYSTEM ARCHITECTURE



PROPOSED METHODOLOGY

Data Collection: Data collection is the first step in the currency recognition system .It is the process of collecting the images of Rs 10,50,100,200,500,2000 from the google and stored in the respective categories.

Image preprocessing: Only the image of the fruits and vegetables is extracted from the collected image. Background of the image is removed .Finally we get only the currency image with no background image so that it is easy for the model to predict the image.

PROPOSED METHODOLOGY

Segmentation: First the input image is converted into grayscale. The images of grayscale contains only the sensitive information. The mathematical function is used to acquire the gray value of the pixel. Finally we get the segmented image of currency.

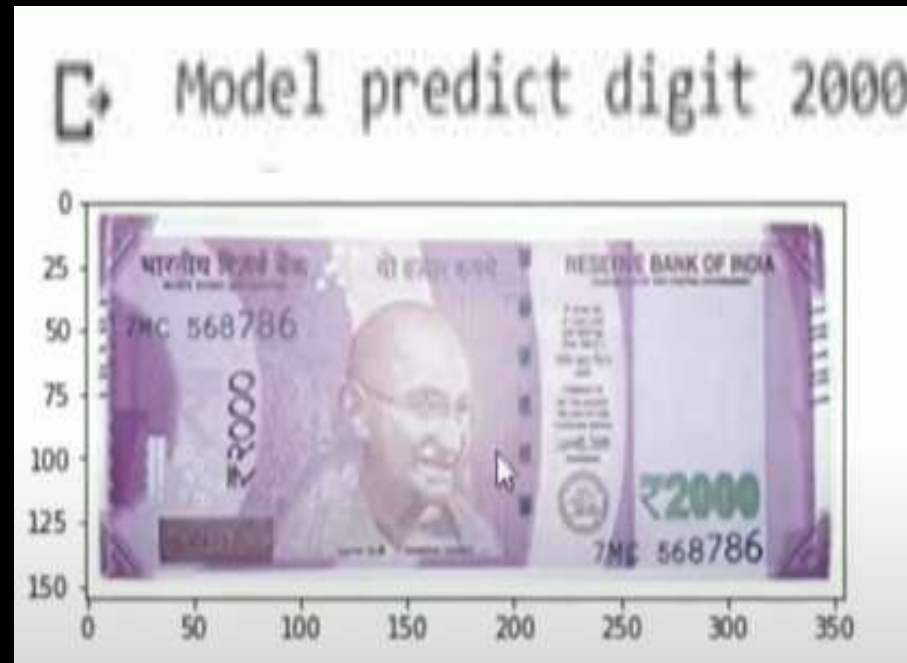
Recognition: Image classification technique is done with the help of CNN algorithm with the help of the dataset where the dataset is split into training, testing, validation set. 70% of the images are used for training, 15% for testing, 15% for validation.

Prediction: Finally, the image of Indian currency is given as input for prediction

RESULT

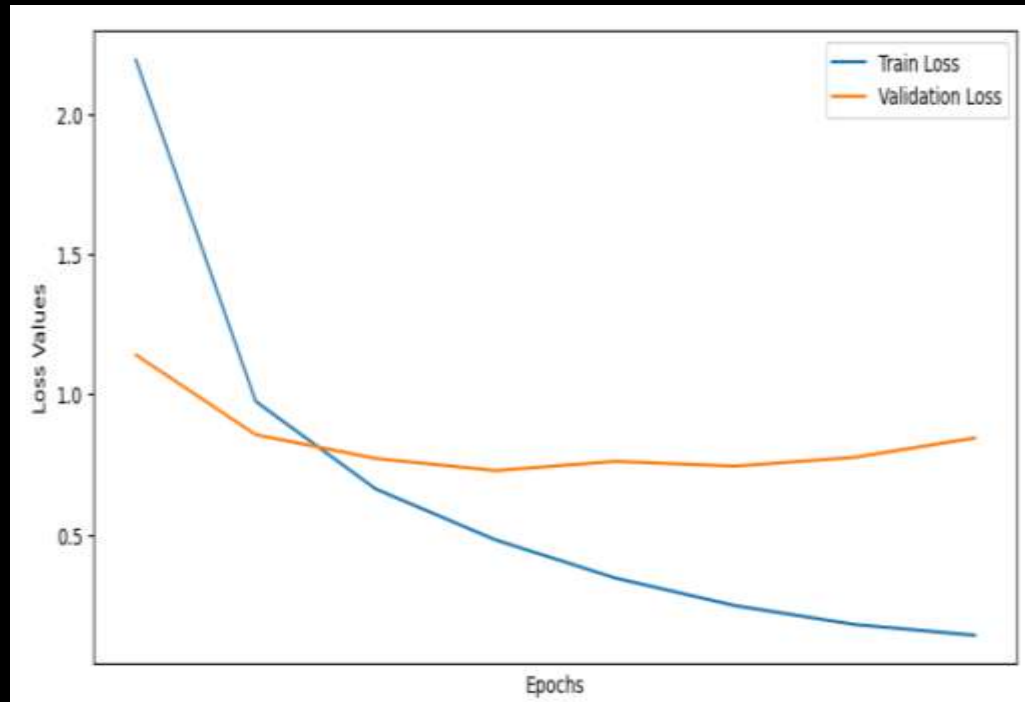
Thus our model predicts the different denominations of Indian currency with good accuracy. It saves the manpower and our efficient time and cost.

PREDICTED IMAGE

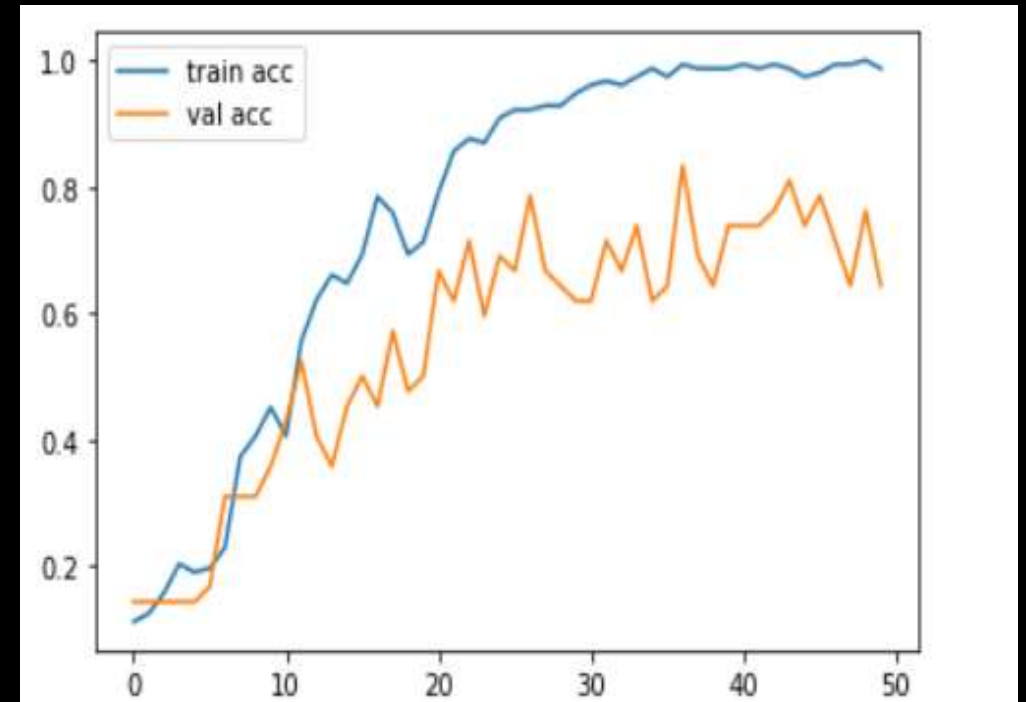


RESULT

TRAINING AND VALIDATION LOSS



TRAINING AND VALIDATION ACCURACY



CONCLUSION

The project "Indian Currency Classifier using Deep Learning" successfully demonstrates the effectiveness of convolutional neural networks (CNNs) in accurately classifying Indian currency notes. The model achieved high accuracy by leveraging the CNN's ability to automatically extract intricate features from the images of currency notes. This project highlights the practicality of deploying deep learning models in real-world applications such as banking, retail, and automated teller machines (ATMs) for efficient and reliable currency recognition. Despite challenges like varying lighting conditions and note wear, the classifier's robust performance indicates its potential for significant impact.

FUTURE ENHANCEMENTS

Multi-currency Support: Extend the model to support multiple currencies. This would involve training on datasets from different countries, making the classifier more versatile and useful in global applications. offer a comprehensive picture of the health of the user by combining dietary analysis and exercise data.

User Interface and Integration: Develop a user-friendly interface and integrate the classifier with existing financial systems. This could include mobile applications for on-the-go currency verification and integration with cash handling machines in banks and retail.

Voice Assistants: Integrate with voice assistants (like Amazon Alexa, Google Assistant) for hands-free interaction.

REFERENCES

- [1] N. E. Caytairo-Silva, J. M. Peña-Alejandro, E. G. Castro-Gutierrez, J. Sulla-Torres, and B. Maraza-Quispe, “Annotated Peruvian banknote dataset for currency recognition and classification,” Data Brief, vol. 51, p. 109715, Dec. 2023.
- [2] R. Jafari, Hands-On Data Preprocessing in Python: Learn how to effectively prepare data for successful data analytics. Packt Publishing Ltd, 2022.
- [3] M. Sewak, M. R. Karim, and P. Pujari, Practical Convolutional Neural Networks: Implement advanced deep learning models using Python. Packt Publishing Ltd, 2018.

REFERENCES

- [4] J. Chaki and N. Dey, A Beginner's Guide to Image Preprocessing Techniques. CRC Press, 2018.
- [5] D. Ghai, S. L. Tripathi, S. Saxena, M. Chanda, and M. Alazab, Machine Learning Algorithms for Signal and Image Processing. John Wiley & Sons, 2022.