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Sahayak: App for Fake Currency Detection

Tanaya Deshpande[1], Prachi Puram[2], Sakshi Bondre[3], Sayli Khodankar[4], Kajal Khodankar[5], Virendra Yadav[6]

Research Scholar, Computer Science and Engineering Department, Priyadarshini College of Engineering, Nagpur, India[1, 2, 3, 4, 5]

Assistant Professor, Computer Science and Engineering Department, Priyadarshini College of Engineering, Nagpur, India[6]

Abstract: Advances in colour printing technology have increased the level of printing of counterfeit note and duplication of notes on a much larger scale. A few years back, printing could not be done in a printing house, but now anyone can print a note of great accuracy using a simple laser printer. As a result, the issue of counterfeit notes instead of the actual ones has increased dramatically. India is unfortunately cursed by problems such as corruption and black money .And counterfeit money notes are also a major problem. This leads to the creation of a system that receives note of counterfeit currency in less time and in a more efficient way. The proposed system provides a way to validate Indian currency notes. Currency note validation is done for image processing concepts. This article describes the release of various aspects of Indian currency notes. MATLAB software is used to extract note features. There is therefore a need for a system that can make the process of separating counterfeit money more manageable and efficient. This paper is an attempt to create a program that will take a scanned picture of suspicious notes of Rs.10, Rs.20, Rs.50, Rs.100, Rs.500 & Rs.2000 and get fake notes to provide a promising solution to the problem of counterfeit money.

Keywords: Rs.10, Rs.20, Rs.50, Rs.100, Rs.500 & Rs.2000, Image Processing, MATLAB, Counterfeit notes, maximum accuracy.

I.INTRODUCTION

Countries around the world are struggling financially with counterfeit bills. Forex risk is a risk to the business market. Simply put, currency duplication is a type of counterfeit currency that is currently emerging due to complex methods such as printing, scanning, etc. In November 2016, Prime Minister Narendra Modi announced that the old 500 and 1000 rupee notes were no longer legal currencies and that a move was being made to redeem the black money. The Prime Minister also introduced a new 500 rupee in 2000 and abolished the old rupee for 500 and 1000 banknotes. According to a report released by the Reserve Bank of India (RBI), the number of counterfeit notes decreased by 31.4% compared to last year, as counterfeiting becomes more difficult as the security of counterfeit notes is strengthened. Coin counterfeiters are widely used in banks, commercial facilities, shopping malls, train stations, government offices, and shopping malls. However, ordinary people cannot understand counterfeit currency because they do not have tools to detect suspicious currency and they are expensive. Time to do it manually. Therefore, the mismanagement of counterfeit bills is directly eradicated from our economy.

II.REVIEW OF LITERATURE

It is important to note that counterfeit money has been around since 1600 BC, when the Greeks began to make money. At that time, coins were issued to obtain precious metals used to make counterfeit coins. India has had banknotes since 1861, but now the problem persists and the problem comes with using different types of printing methods and the inclusion of various elements of obtaining fraud in paper money to combat fraud. However, with the advent of innovation and the development of better scientific methods of detecting counterfeit money emerges that makes this work more accurate at an accurate rate. Current procedures include 3D photographs, shaded lines, a pencil containing iodine (which responds to starch available on paper money) and the use of UV beams to separate counterfeit types. However, all the new devices involved these days in banks are open to non-professionals; as a result, the issue of counterfeit identification remains under development. In this paper, we set out a strategy that can serve as a human tool to simply separate counterfeit money. The use of computer imagery management for this reason gives us an effective alternative to creating a solid counterfeit identification framework that can benefit society as a whole. Counterfeit recognition of Bangladeshi notes based on image management was terminated by Ahmed et. al. Another option was Ogeilaet. al to identify counterfeit cash in electronic cash trading. Identifying counterfeit money was very important with the way the ATM money shop was affected. Another exciting alternative was presented by Santhanam. al. by incorporating the concept of polarization

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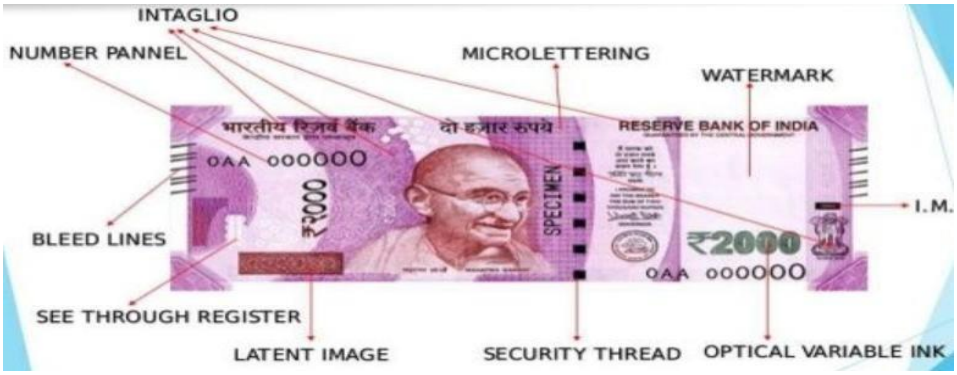
and holographic recognition techniques alongside imaging management processes. Alshayeji et. al. has adopted a certain method of cutting a counterfeit local currency plane. A new fraudulent acquisition strategy is being introduced and can be referenced to show a more accurate picture. From now on, Limit. al. introduced a method called hyper ghastly imaging to detect counterfeit money. The higher goal brought a respectable show; however it has met with the disadvantages of slower test speed. A low-speed response was given to Baberet. al. by using image processing to find edges of paper notes. The edge detection methods were less reliable, therefore, we proposed new statistics for extracting key protection points. Encouraged by the high level of advancement in the field of image management and access to effective photographic procurement gadgets, we introduced a cost-effective image management-based approach to image management. The proposed method separates the different elements of the Indian currency and uses them to identify counterfeit currency. The best security images were removed using different image handling statistics and later format matching was done to separate forgery. The novelty of the method presented is in the image management application for the release of the best security images in the given images.

III.FEATURES USED TO DETECT FAKE CURRENCY



SECURITY FEATURES OF INDIAN BANKNOTE:

A. Watermark, B. Latent Image, C. Security Thread, D. Identification Mark, E. Fluorescence

A. Watermark

All notes of the Mahatma Gandhi series banknotes contain watermarks with blur and shading effects as well as the multidirectional lines of the Mahatma Gandhi window.

B. Latent Image

On the other side of the 1000, 500, 100, 50 and 20 rupiah notes, a straight strip to the right of the image of Mahatma Gandhi has a hidden image showing the exact denomination numerically. . Hidden images are only visible when the note is placed horizontally at eye level.

C. Security Thread

Released in October 2000, Rs.1000 notepad contains a bulletproof block with a burning window on the front that reads 'Bharat' (in Hindi), '1000' and 'RBI'. But on the other hand, it was the complete opposite. 500 rupees and 100 rupees look good and the seat belts are marked "Bharat" (in Hindi) and "RBI". When illuminated, a 500 rupee security code is displayed as a single line. Note Rs.5, Rs.10, Rs.20 and Rs.50 include a clear, fully-mounted security chain with windows with "Bharat" (Hindi) and "RBI" pronunciations. The security chain appears on one side of the Mahatma image. The pre-scanned introduction to the Mahatma Gandhi book series features a simple, hidden and fully encrypted secure sequence.

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D. Identification Mark

A special feature in the intaglio is presented to the left of the watermark window for all notes except the note of Rs.10 / -. This feature has a variety of different layouts (Rs.20-Vertical Rectangle, Rs.50-Square, Rs.100-Triangle, Rs.500-Circle, and Rs.1000-Diamond) and helps the visually impaired to identify the segment.

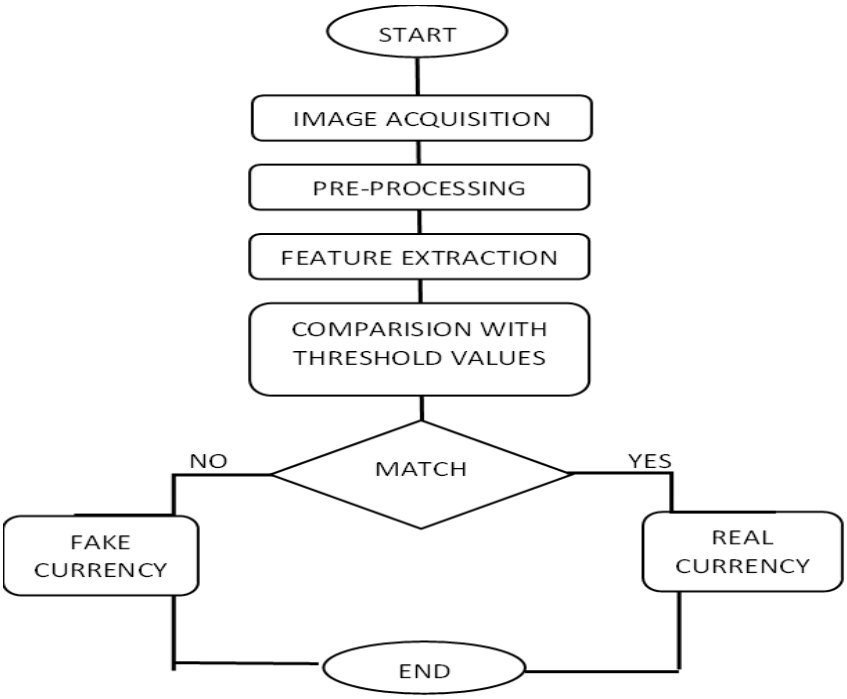
E. Fluorescence

Numerical number panels are printed in fluorescent ink. The notes also have fibre optics. Both can be seen when notes are exposed to ultra-violet light.

IV.METHODOLOGY

Initially, after receiving image data various steps have to be done to get results in the form of real or fake currency.

- Image Acquisition
- Pre-Processing
- Feature Extraction
- Comparison with Threshold



1. Image Acquisition-

In the first stage of image processing, images are displayed as input to the system, filtered using a scanner, and sent to the system for further processing.

2. Pre-processing-

Pre-data processing is the process of transforming or encoding data so that it can be easily divided by the system. This is one of the most important steps. It is designed to refine the critical visual elements for analysis. By prioritizing the image, we try to remove any unwanted distortions from the data or improve some of the functionality needed for the next stage of analysis and processing. The different pre-processing stages are as follows

- Grey Scale Image Conversion

RGB images contain a large amount of information that may not be necessary to use. When you convert an RGB image to grayscale, you lose a lot of unwanted information to process and reduce code complexity.

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- **Edge Detection**

Edge detection is an image processing method to determine the boundaries of objects in an image. We can see the power and advantage of the edge by filtering out the noise

- **Image Segmentation**

It is used to divide an image into regions or several segments. Then threshold segmentation is used to find the threshold values. The goal is to transform representations into simple and expressive images.

- **Features Extraction**

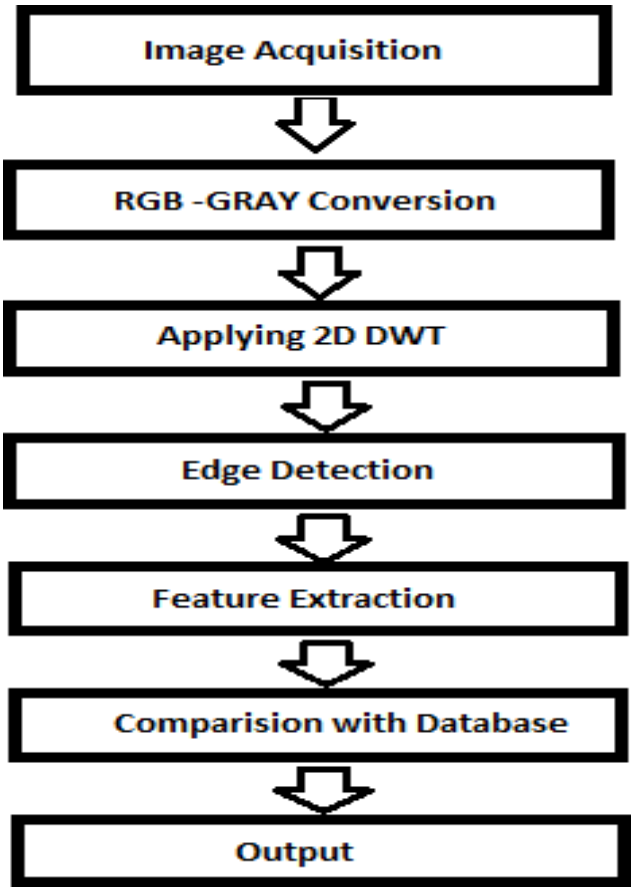
The export function is one of the most important and difficult tasks. The features we are testing are expected to extract the information received from the input file. One of the four most important security measures found in this system is as follows

•Security thread •Intaglio printing
•Gandhiji's image watermark •Angular bleed lines on the left and right sides of the note

3. COMPARISON WITH THRESHOLD-

After comparing the value of the trained image with the input data image, by examining the difference between certain threshold values and input data values we will be able to conclude if currency is real or counterfeit.

V.PROPOSED ALGORITHM FLOW



VI.EXPERIMENTAL RESULT

The user is provided with a Graphical User Interface, initially the user requires to upload the scanned copy of suspicious notes, next user needs to click on the processing button after this a pop-up message will emerge on the screen which will reveal the outcome of the image processing.

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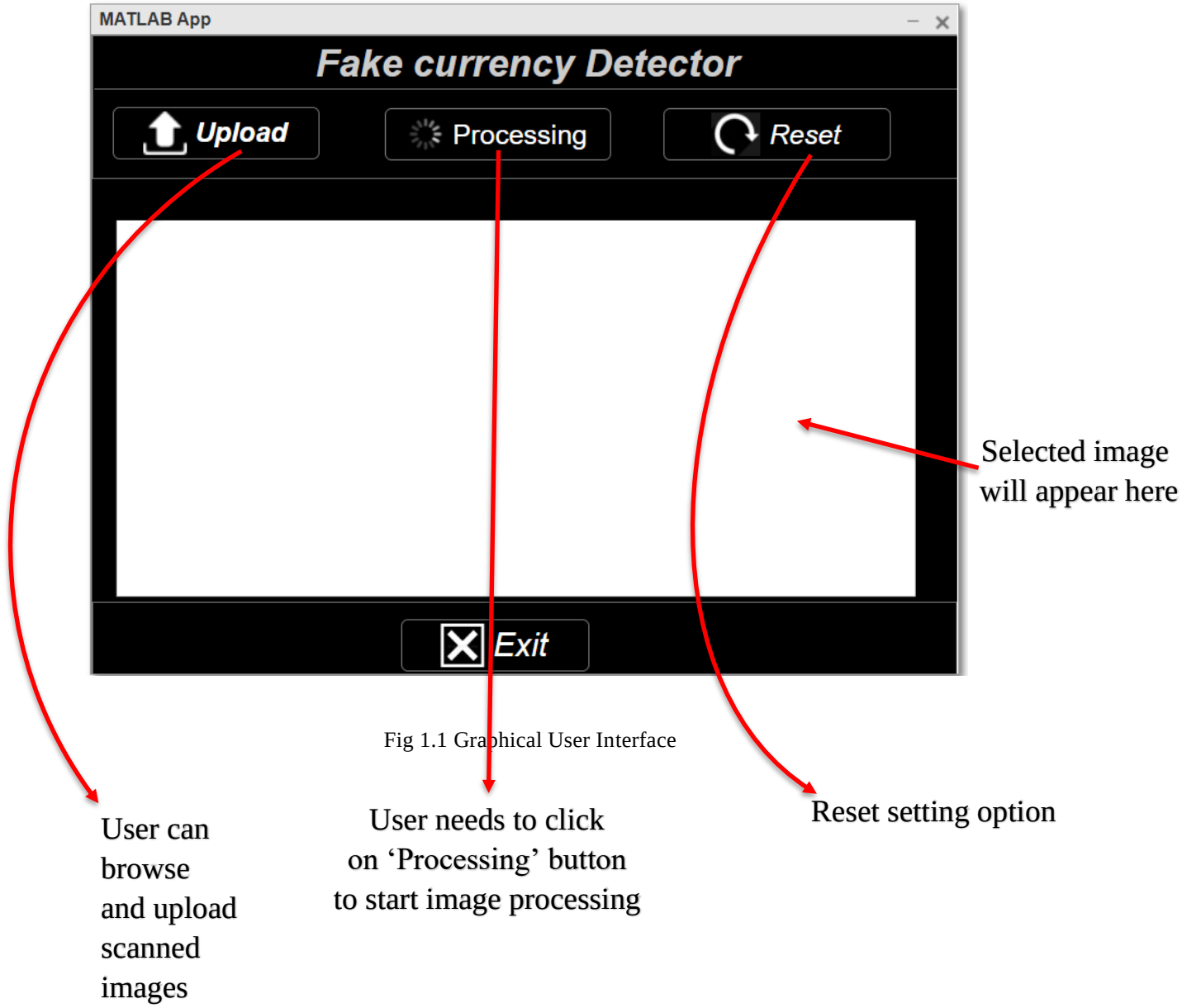

Fig 1.1 Graphical User Interface

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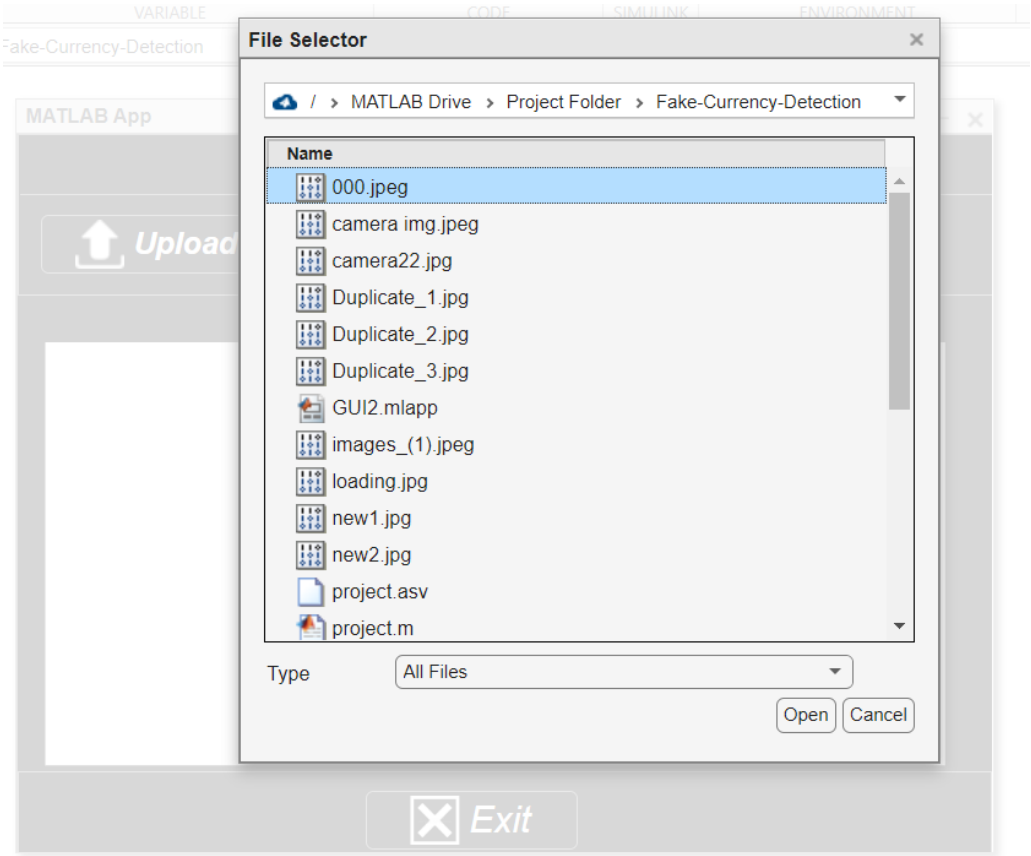

Fig.1.2 Selection of image for image processing

Fig.1.3. Selected image for processing

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Fig.1.4. Pop-up message showing result of test image 1.

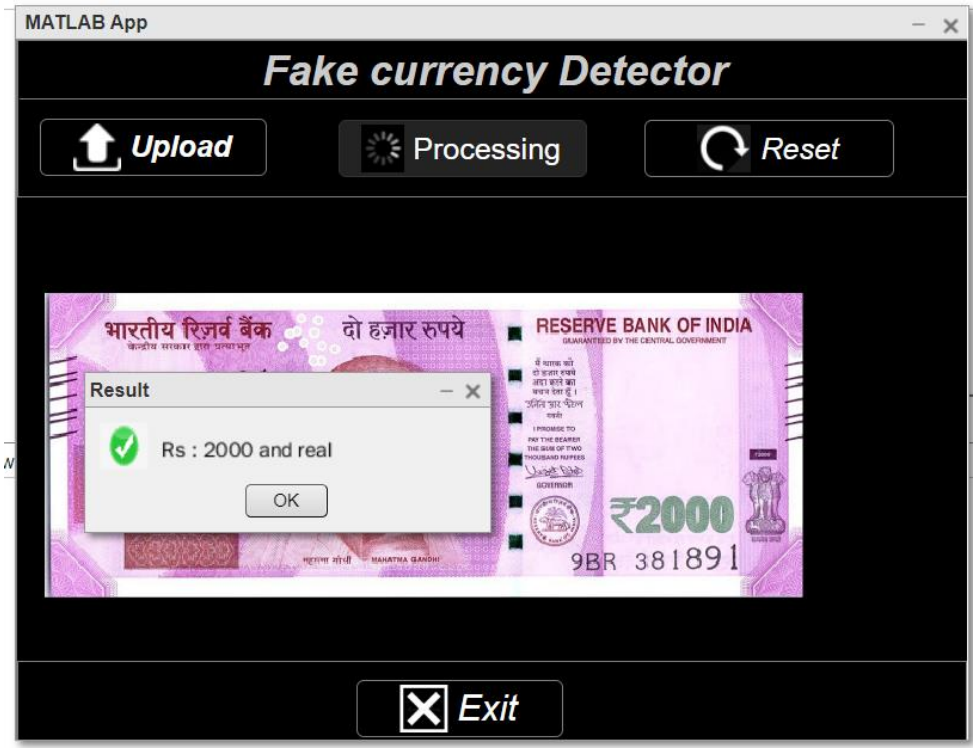

Fig.1.5.Result of test image 2.

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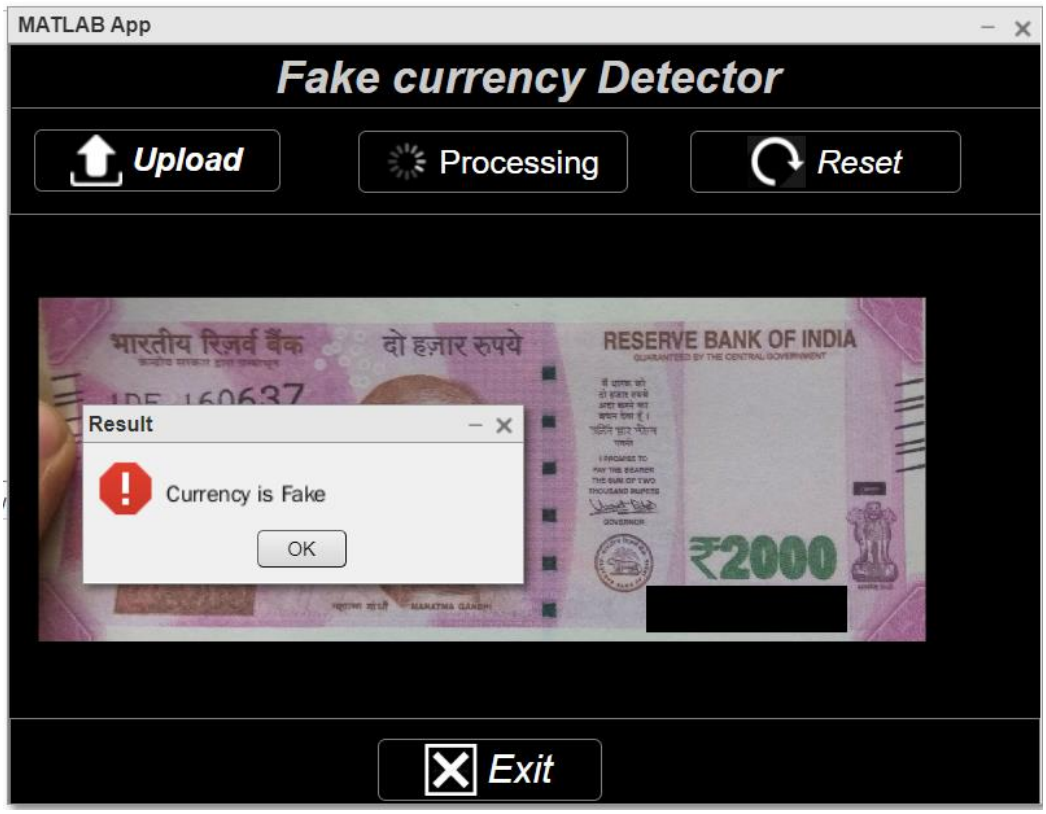

Fig.1.6. Test result of currency with missing features

VII. CONCLUSION

An important goal in developing this promising software is to create a better framework for faster and easier access to determining real and counterfeit currency notes. The proposed strategy provides an effective strategy for the location of counterfeit money based on real ideas of notes. This project is a MATLAB-based framework for the naturalization of Indian financial security features. The four most important security features in the business are being investigated, namely the security character strap, the Gandhi portrait watermark and the left-hand spot and the right-half note. Graphic Processing has been used to highlight outstanding and analytical. Successful image management and statistics will provide a low-cost framework with strong and straightforward results as demonstrated by test results. The future vision of this approach is to use a framework to identify foreign currency forms and to integrate the submitted system into a portable application for the best possible benefit to ordinary people.

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IX. REFERENCES

[1]. Security Features of Indian Banknotes, Available at: https://www.rbi.org.in/scripts/ic_banknotessecurity.
[2]. Ahmadi and S.Omatu,"A Methodology to Evaluate and Improve Reliability in Paper Currency Neuro-Classifiers" Proceedings 2003 IEEE International.
[3]. E.H.Zhang, B. Jiang, J. H. Duan, Z. Z. Bian," Research on Paper Currency Recognition by Neural Networks", Proceedings of the 2nd Int. Conference on Machine Learning and Cybernetics, 2003

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[4]. Dipti Pawade, Pranchal Chaudhari and Harshada Sonkamble,"Comparative Study of Different Paper currency and coin currency Recognition Method", International Journal of Computer Application, ISSN 0975-8887, Vol 66, No 23, Mar 2013

[5]. Foresti G.L, Regazzoni C,"A hierarchical approach to feature extraction and grouping" IEEE Trans Image Processing, 2000; 9(6):1056-74.

[6]. Hanish Agarwal, Padam Kumar, "Indian currency note denomination recognition in color images", IJACECT, Vol. 1, ISSN 2278–5140.

[7]. H.Hassanpour, A.Yaseri, G.Ardeshiri, "Feature Extraction for Paper Currency Recognition" 1-4244-0779-6/07/2007 IEEE.

[8]. Megha Thakur, Amrit Kaur, "VARIOUS FAKE CURRENCY DETECTION TECHNIQUES" International Journal for Technological Research in Engineering Volume 1, Issue 11, pp.1309-1313, July-2014.

[9]. Nadim Jahangir and Ahsan Raja Chowdhury,"Bangladeshi Banknote Recognition by Neural Network with Axis Symmetrical Masks" 1-4244-15519/07/$25.00 ©2007 IEEE

[10]. Lohweg, Volker, et al. "Banknote authentication with mobile devices." IS&T/SPIE Electronic Imaging. International Society for Optics and Photonics, 2013

[11]. Prof. Sowmyashree, ShreyaShetty, TruptiGhotkar, ChirayuYadav, SurajKanojia, "Currency Recognition and Fake Note Detection." IJREAT: International Journal of Research in Engineering & Advanced Technology, Volume 3, Issue 5, pp.179-182, ISSN: 2320-8791, Oct-Nov, 2015

[12]. K. Satish, Y. K. Viswanadham, and I. Leela Priya, "Money to ATM–fake currency detection," International Journal of Computer Science and Information Technologies, vol. 3, no.5, pp. 5046- 5050, 2012.

[13]. A. Shah, K Vora, and J. Mehta, "A review paper on currency recognition system," International Journal of Computer Applications, vol. 115, no. 20, pp. 1-4, 2015.

[14]. Z. Ahmed, Y. Sabina, M. N. Islam, and R. U. Ahmed "Image processing based feature extraction of Bangladeshi banknotes", Software, Knowledge, Information Management and Applications (SKIMA), 8th International Conference on IEEE, pp. 1-8, 2014.

