iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** IV **Month of publication:** April 2019

DOI: https://doi.org/10.22214/ijraset.2019.4464

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 7 Issue IV, Apr 2019- Available at www.ijraset.com

Fake Product Identifier

Nisha Rathod[1], Navani Udgaonkar[2], Tanvi Garud[3], Isha Takawale[4], Sawani Ingale[5]
[1, 2, 3, 4, 5]*Computer Department, Savitribai Phule Pune University*

Abstract: ***Counterfeit consumer goods are goods, often of inferior quality, made or sold under another's brand name without the brand owner's consent. Sale of these goods still remains a significant problem for shoppers. Grammatical and spelling mistakes, flawed fonts and logos, missing accessories, minute changes in design are some of the ways these products can be recognized as counterfeit. Our project aims at identifying such goods through photos captured by the user of the product.***
Product counterfeiting is a serious problem causing the industry estimated losses of billions of dollars every year. With the increasing spread of e- commerce, the number of counterfeit products sold online increased substantially. We propose the adoption of a semi-automatic workflow to identify likely counterfeit offers in offline platforms. The workflow includes steps to generate search queries for relevant product offers, to match and cluster similar product offers, and to assess the counterfeit suspiciousness based on different criteria. The goal is to support the periodic identification of many counterfeit offers with a limited amount of manual effort.
Keywords: image processing, opencv, ssim, mse, fake product, counterfeit product, counterfeiting

I. INTRODUCTION

The production of counterfeit consumer goods is harmful not only to brand owners but also people who many times buy these products unknowingly. The necessity of being able identify whether the product is 'real' or 'fake' is, hence, very high.

Our proposed system will make use of images to catch abnormalities of the product by comparing it to the actual product. We will make use of the Structural Similarity Index(SSIM), which can be used to compare two images with Python, and extend it's approach so as to visualize the difference between images. Bounding boxes will be drawn around the regions in the images that differ. These will be then used to determine whether the product is genuine or a counterfeit product.

II. ALGORITHM

A. *Structural Similarity Index Model*

The Structural Similarity Index Model (SSIM) is a method for measuring the similarity between two images. The SSIM index can be viewed as a quality measure of one of the images being compared provided the other image is regarded as of perfect quality. It is an improved version of the Universal Image Quality Index (Universal Image Quality Index uses image distortion method).

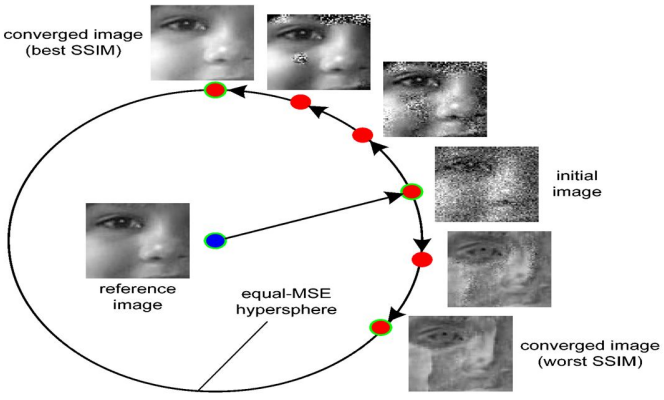


Fig 1: SSIM

B. *Mean Squared Algorithm*

Mean Squared Error or Mean Squared Deviation measures the average of the squares of the errors i.e the average square difference between the estimated values and what is estimated. MSE is a risk function, corresponding to the expected value of the squared error loss. The fact that MSE is almost always strictly positive (and not zero) is because of randomness or because the estimator does not account for information that could produce a more accurate estimate.

©IJRASET: All Rights are Reserved

$$MSE = \frac{1}{n}\sum \underbrace{\left(y - \hat{y}\right)^2}_{\text{The square of the difference between actual and predicted}}$$

Fig 2:MSE Equation

III. PROPOSED METHEDOLOGY/IMPLEMENTATION

Our implemented method uses the following System Architecture

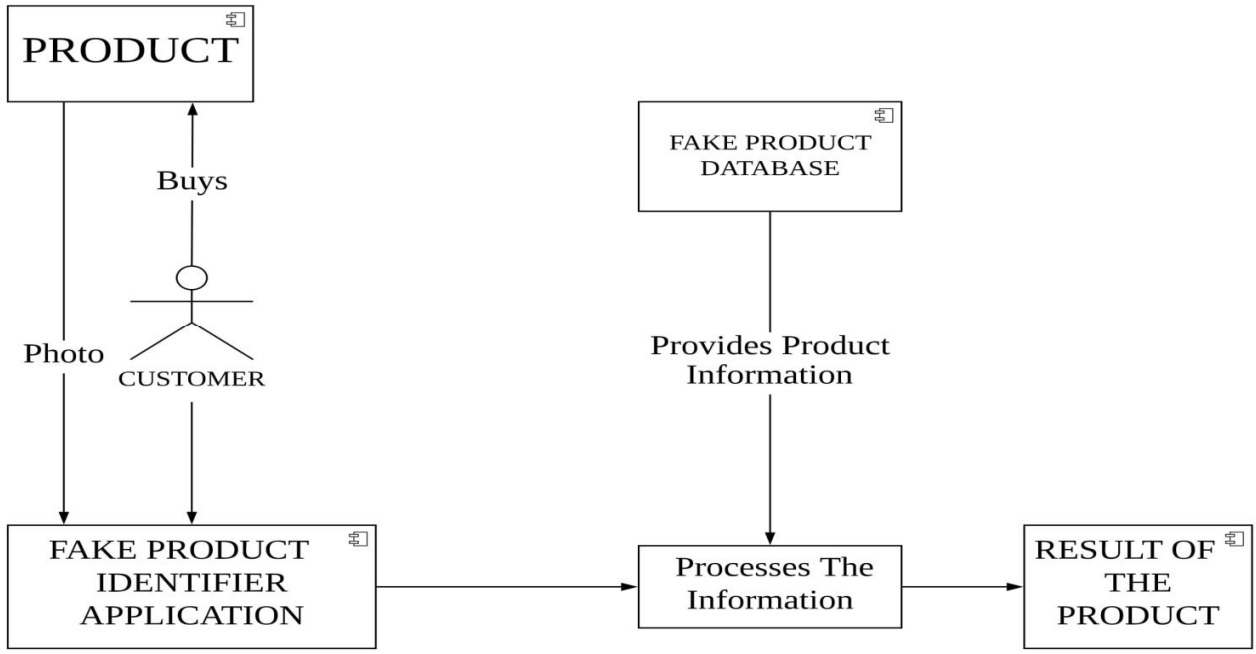


Fig 3:System Architecture

This architecture explains the following steps

A. User either clicks the picture product from the camera module or inserts an image through local directory.
B. The image gets converted into Grayscale.
C. By SSIM and Mean Squared Error it locates the difference between the images.
D. Generate a matplotlib figure, loop over our images one-by-one, and add them to the plot.
E. If the image of the product is original the value for MSE is 0.0 and value for SSIM is 1.0.
F. As the value of the MSE increases the image are lesser similar and as the value of SSIM decreases the images are less similar.
G. Hence we have compared two images using Python OpenCV and Scikit-Image to detect the originality of the product.

©IJRASET: All Rights are Reserved

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 6.887
Volume 7 Issue IV, Apr 2019- Available at www.ijraset.com

IV. RESULTS

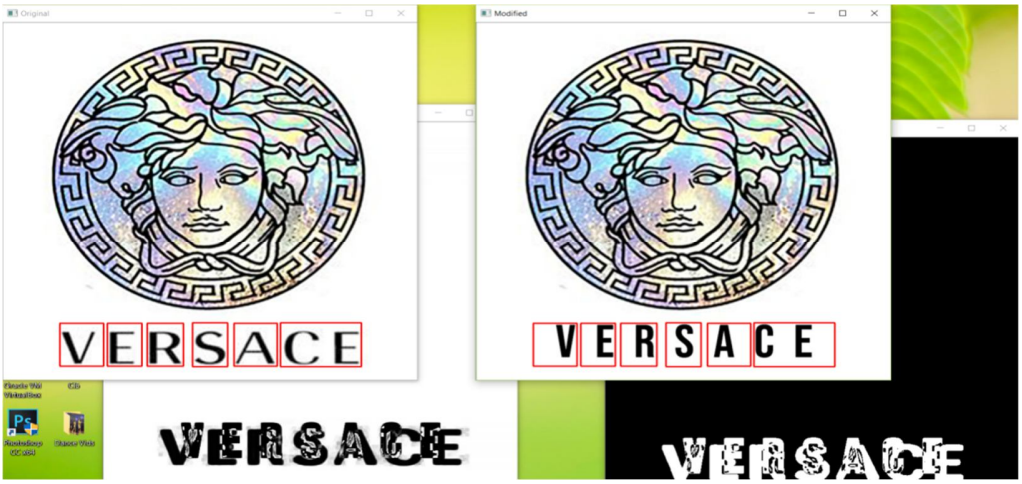


Fig 4:Output 1

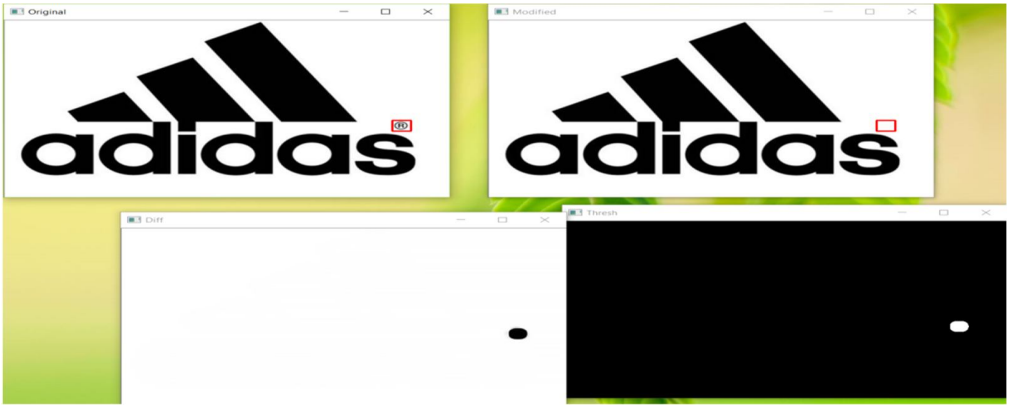


Fig 5:Output 2



Fig 6:Output 3

©IJRASET: All Rights are Reserved



Fig 7: Output 4

V. RELATED WORK

We will briefly review existing work on Counterfeit detection for paper bill, Fake Currency Detection, logo recognition using context dependent criteria. Image processing is commonly used for detection purpose.

1) *Counterfeit Detection of Paper Bill:* [2] uses Canny Edge Technology which presents image enhancement and image sensing. They performed counterfeit detection on some Philippine notes which was achieved by a well-defined security feature OVD(optically variable device) which is an improvement to traditional way of detection of bills which are watermark, security thread, see through marks. Algorithm used to implement the problem statement is Canny Edge detection. It is an edge detection operator and uses multistage algorithm to detect edge in the image.
2) *Fake Currency Detection:* [3] Was proposed to detect fake currency as currency faking is disastrous nowadays. Reserve bank of India(RBI) has the authority to maintain and release currencies throughout the country. The working of the current paper method was carried out on 500 and 1000 rupee note as they are highly expensive.

The steps used in for detection of fake currency are:

a) *Read Image:* The image captured using camera and stored as data set.
b) *Image Conversion:* The image stored is converted into grayscale according to the RGB pixel value.
c) *Threshold Saturation:* The saturation(value must be high) and luminance(value must be low) values are set as threshold.
d) *Minor Closing:* If the currency is a fake then there is a black line separation by a few pixels whereas for real there is no separation.
e) *Final Cleanup:* The unwanted portion/region of the image is removed.
f) *Count Black Lines:* If the count of black line is 1 then the image is real otherwise it is fake.

VI. CONCLUSION

By using the Structural Similarity Index(SSIM) and the Mean Squared Error(MSE) algorithm, the system is able to find the differences between the images and the exact originality can be found out. For complete originality, the values are MSE=0.0 and SSIM=1.0. The values are inversely proportional to the difference i.e, greater the value, lesser the difference and vice versa. The system is hence equipped with detecting counterfeiting effectively and furthermore, will help reduce it and in turn, boost the economy.

VII. ACKNOWLEDGEMENT

I take this to express my deep sense of gratitude towards my esteemed guide Prof. Nisha Rathod for giving me this splendid opportunity to select and present this seminar and also providing facilities for successful completion.

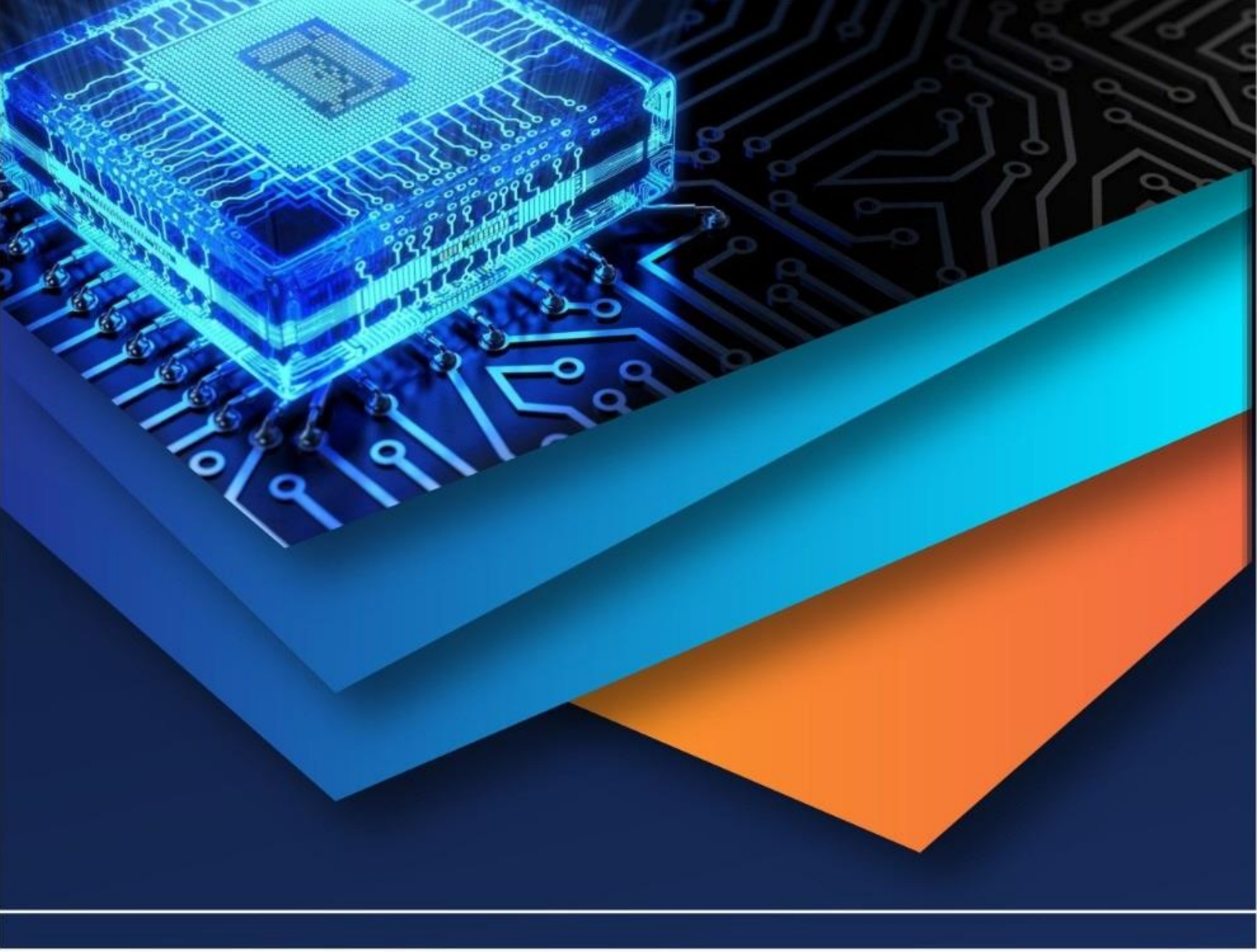
I thank Dr. S. M. Chaware, Head, Department of Computer Engineering, for opening the doors of the department towards the realization of the seminar, all the staff members, for their indispensable support, priceless suggestion and for most valuable time lent as and when required. With respect and gratitude, I would like to thank all the people, who have helped me directly or indirectly.

©IJRASET: All Rights are Reserved

REFERENCES

[1] Hayden Wimmer, Victoria Y. Yoon , "Counterfeit Product Detection: Bridging the gap between design science and behavioural science in information systems research", September 2017, pp 3-38
[2] Ballado, A. H. Jr., Dela Cruz, J. C., Avendaño, G. O., Echano, N. M., Ella, J. E., Medina, M.E.M., Paquiz, B.K.C. , "Philippine Currency Paper Bill Counterfeit through Image Processing using Canny Edge Technology" , IEEE, December 2015, pp 1-4
[3] S.Atchaya , K.Harini, G.Kaviarasi, B.Swathi, "Fake Currency Detection Using Image Processing" , International Journal of Trend in Research and Developement (IJTRD), September 2016, pp 72-73
[4] L. Alcock, P. Chen, H. Ch'ng, S. Hodson, "Counterfeiting: tricks and trends, Journal of Brand Management", 11(2) (2003), pp 133-136.
[5] P.H. Bloch, R.F. Bush, L. Campbell, "Consumer ―accomplices‖ in product counterfeiting: a demand side investigation", Journal of Consumer Marketing, 10(4) (1993), pp 27-36

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)