iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 5 **Issue:** II **Month of publication:** February 2017

DOI: http://doi.org/10.22214/ijraset.2017.2093

www.ijraset.com

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

Volume 5 Issue II, February 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Counterfeit Indian Currency Detection Through Image Processing in Labview

Arti Bhingare[1], Prof. Swati Dixit[2]
[1]*Electronics and Telecommunication Engineering Department, RTMN University*
[1]*Research Scholar M.Tech.in Communication Engineering*

***Abstract**: Forged currency is problem for almost all cash based economy country like India. Counterfeit currency notes are big hurdle for India. In past few years only printing house of Reserve Bank of India has the ability to print banknotes but now a days any person can print the banknote with the help of different technologies such as Color print technology, laser printer, duplicating technology and scanning technology. Due to advancement in these technologies counterfeit currency become more and more serious problem for Indian economy. Therefore there is a need to design a machine that recognize fake banknote from genuine banknote with low cost. In proposed system automatic fake Indian currency detection will be done through image processing. LabVIEW tool will be used for extract the security features of Indian paper currency.*
Keywords**: Counterfeit detection, Image acquisition, Image processing, LabVIEW, Security features

I. INTRODUCTION

Digital Image Processing is a rapidly evolving field with growing applications in Science and Engineering. Image processing is a technique of recording and presenting information about an image in a visual appearance. For the foundation of image processing computer analyzed on digital image through several aspect. Firstly, computer equipped software for image processing, now a days there are lots of software platform available for image processing, then image acquisition and processing part though particular filtering techniques and at last result on display. LabVIEW platform is selected for counterfeit Indian currency detection system as it gives accurate result and also take less time for operation.

Now a days image processing has numerous applications. In proposed system image processing will be used for determine fake currency paper notes from genuine paper currency notes and fake paper currency notes. Proposed system can be used in Automatic seller machine and Automatic teller machine, self-servicing kiosks, food and beverage dispensers. In this century 90% seller or shopkeeper have computer or laptop for billing purpose, proposed system can be used in their shop for counterfeit note detection with adding simple hardware of less cost.

Counterfeit money is replica of original money which is produced without legal permission of government. The Reserve Bank of India (RBI) is the only government entity authorized to print, issue and distribute legal Indian currency within a country. These distributed currency banknote and coins are circulate among public. Indian public passes currency hand on and utilize such as legal tender, without full knowledge of fake and genuine currency. Most probably high value banknote or paper note are forged. According to report given by Indian Statistical Institute, 250 out of every 10 lakh notes in society are counterfeit. Investigative agencies and RBI seized and recovered 6.32 lakh fake currency notes with face value for rupee 30.43 corers in 2015. One of the most efficient methods to stop counterfeiting can be the use of fake currency detection tools /machines/software that are easily available and cost effective with more accuracy.

In proposed system images of the paper currency will be acquired through camera by applying UV (ultra violet) backlighting, extra light to the banknote so that the hidden marks of currency are appeared on the image. Then image will be further processed by applying the image processing techniques using LABVIEW tool.

II. RELATED WORK

There have been number of attempts to solve the problem of counterfeit currency detection using different technique such as IR, MG, image processing, polarization principle and holographic technique. Ballado and others [1] proposed detection of fake Philippine peso paper bill currency through image processing using Matlab tool. Zahid and all others [2] develop a core software system to build an automated counterfeit currency detection tool for Bangladeshi banknotes. In paper [3], authors have included two types of technique to identify fake Indian currency. One of them is Ultra Violet (UV) detection using LabVIEW for watermark security feature. Another one is using the polarization of light when passed through the currency. In paper [5], author discussed

©IJRASET: All Rights are Reserved

Volume 5 Issue II, February 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

different methods for counterfeit Indian currency detection. Such as counterfeit detection pen, image processing using MATLAB, Ultraviolet counterfeit detection scanner.

Reserve Bank of India print paper notes as per the government rule with different security features. Available counterfeit currency detection machine determine fake notes by using magnetic detection technique and IR sensor technique. But for more accuracy in counterfeit currency detection machine maximum security features form note should be extracted. Some counterfeit currency detection machine provides better accuracy but those systems are not cost effective. Machine available with high accuracy are not affordable to small business shopkeeper. Proposed system will determine the counterfeit currency paper note using image processing through LabVIEW tool. Main objective of system is to find fake currency from genuine and counterfeit currency paper note by connecting simple hardware to user's laptop and personal computer in affordable price with maximum accuracy.

III. SECURITY FEATURES OF INDIAN BANKNOTE (2000 & 500 RS)

See through register - Denominational numeral is printed on both side of note at left side of note. It see when note is held against the light.

Latent image - on the extreme left side of Indian banknote contains a latent image showing the respective note value in numbers. This security feature is visible only when the note is held horizontally at strait eye level.

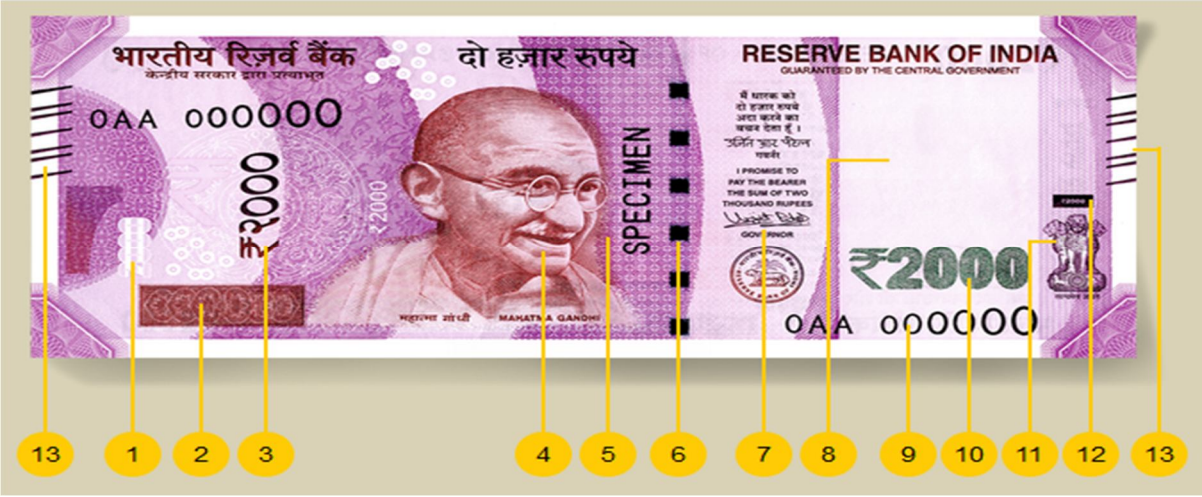


Fig 1: security features on Indian currency

Devanagri number - Denominational numeral of respective note value is printed in Devanagri. Devanagri is an alphasyllabary alphabet of India and Nepal.

Portrait of Mahatma Gandhi – Portrait of Mahatma Gandhi shift in the center. In old banknote portrait of Mahatma Gandhi at the left corner.

Microlettering - This security feature is on center of note near to mahatma gandhi portrait. In microlettering 'RBI' and 2000 is printed in micro letters. This security feature can be seen well under a magnifying glass. This feature is available only in 2000 rupee note.

Security thread - Security thread is available on 2000, 500, 100 note at right side of note with 'bharat' in hindi and 'RBI', respective denominational value print on security thread. Colour of the thread changes from green to blue when the note is slanted.

Guarantee clause - Guarantee clause, governor's signature with promise clause and RBI emblem towards right.

Electrotype Watermark - Indian banknote contain the mahatma Gandhi portrait electrotype watermark. This security feature can be seen well under UV light.

Number panel – Number panel with numerals growing from small to big on the top left side and bottom right side.

Denominational number - Denominational numeral of respective note value in colour changing ink on bottom right side. Colour of the number changes from green to blue when the note is slanted.

Ashoka pillar – Ashoka pillar emblem on the right side of note.

For visually impaired people

Horizontal rectangle – Horizontal rectangle with 2000 is raised print on the right side of 2000 rupee note. Circle with 500 is raised

©IJRASET: All Rights are Reserved

Volume 5 Issue II, February 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

print on right side of 500 rupee note.
Bleed lines – Seven angular bleed lines on right and left side in raised print on 2000 rupee note. Five angular bleed lines on right and left side in raised print on 500 rupee note.
Features on back side of note
Year of printing
Swachh Bharat logo with slogan
Language panel towards the center
Motif of Mangalyan

IV. PROPOSED METHODOLOGY

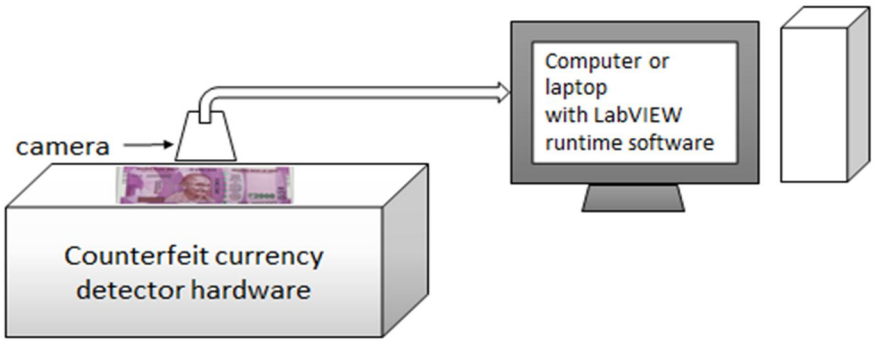


Fig 2: Basic design of proposed system

Counterfeit currency detector hardware consist of processor unit, UV light, LED's, motors, camera and power unit. During the process UV light and LED light will on for few seconds. With the help of processor UV light and LED light will get on off. Motors tilt the note plate with the help of microcontroller.
The proposed system will work on two set of images. Set one includes genuine note images, which will be store in database for further process. Second set include test images on which verification to be done.

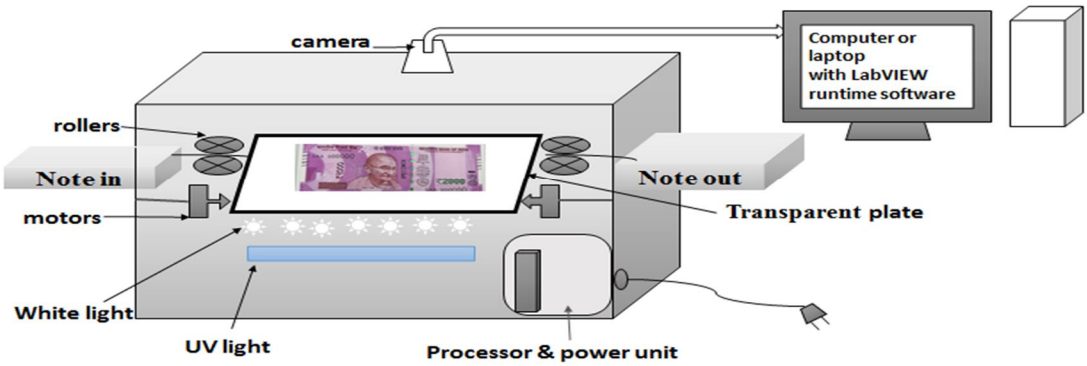


Fig 2: transparent (note) plate is strait

Proposed system detects the fake Indian banknote by extracting the some features from banknote. Those features are:
Electrotype Watermark is visible in UV light therefore in counterfeit currency detector hardware UV light is fixed. Camera will capture the image 1 in UV light background.
See through register feature see when note is held against light therefore for extra light LED's light are assemble in counterfeit currency hardware. Camera will capture image 2 in extra light background. This image can be used to extract other features also for example Asoka pillar.
Security thread and denominational number features print in color changing ink. When note held strait color of security thread and denominational value is green and when tilted it will change to blue. For these features motors and microcontroller are assembled in

©IJRASET: All Rights are Reserved

Volume 5 Issue II, February 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

counterfeit currency detector hardware. Camera capture image 3 of tilted note.

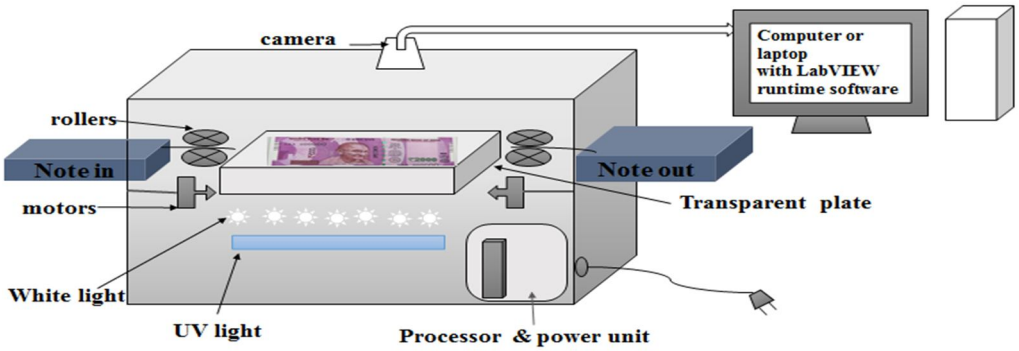


Fig 3: transparent (note) plate is tilted

The proposed system working steps are presented as follows –
Indian banknote will placed in currency detector box.
Image 1 is captured with UV light effect for watermark feature. UV light will get off. The LED light will get on and image 2 is captured. After few second it will get off.
Then tilted banknote image is captured that is image 3.
Send these images to computers or laptop for image processing using LabVIEW software.
In LabVIEW software this test image is compare with genuine note image present in database. And calculate total number of security feature matched between test currency image and genuine currency image.

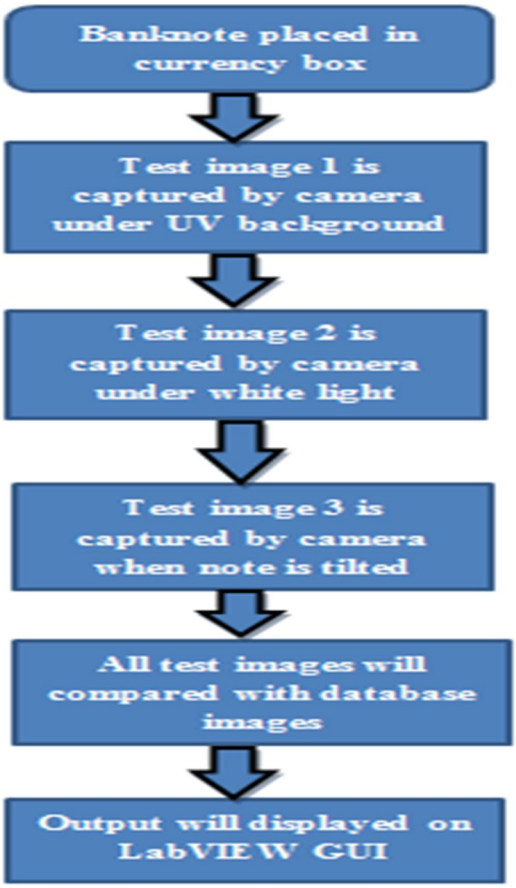


Fig 4 : Flowchart for conterfeit notbe detection

©IJRASET: All Rights are Reserved

Volume 5 Issue II, February 2017
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

V. EXPERIMENTAL RESULTS

Watermark feature and see through register feature are visible only in UV Light and White Light. Test image is capture under UV and White Light, after processing the image both features are detected. Sometimes in counterfeit note these security feature are not present. By comparing test image and data base image output is created. Similarly other features are extracted from the note, after comparison counterfeit note and genuine note is identified.

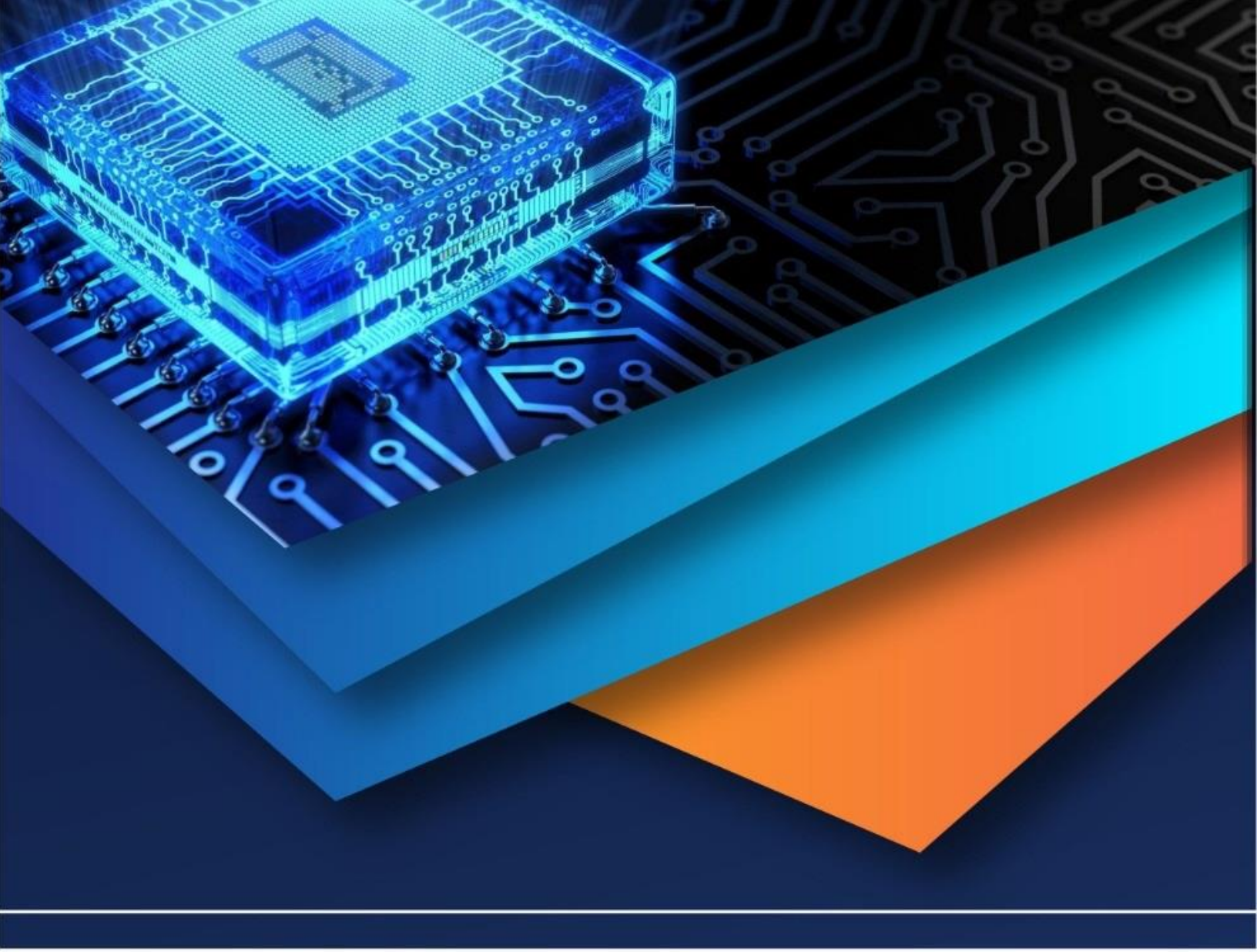
Fig 6: Test image under UV Light and White Light

Fig 7: Normal image of indian 500 rupee indian banknote

REFERENCES

[1] Ballado, A. H. Jr., Dela Cruz, J. C., Avendano, G. O., Echano, N. M., Ella, J. E., Medina, M.E.M., Paquiz, B. K. C. "Philippine currency paper bill counterfeit detection through image processing using canny edge technology" 2015 IEEE
[2] Kamesh Santhanam, Siram Sekaran, Sriram Vaikundam, Anbu mani Kumarasamy "counterfeit currency detection technique using image processing, polarization principle, and holographic technique" 2013 IEEE
[3] M. Deborah, C. Soniya Prathap. "Detection of fake currency using image processing" 2014 IJISET
[4] Ajinkya Babar, Swapnil Jawalekar, Kiran Yadav, Dr. D. B. Salunke "counterfeit currency detector" jun 2015 IJTRA
[5] Sagar S. Lawade, gayatri S. hedau, Apurva C. Ramgirwar "fake currency detection using image processing" IJRISE
[6] B. sai Prasanthi, D. Rajesh Shetty "Indian paper currency authentication system using image processing" IJRET 2015
[7] Snigdha Kamal, Simarpreet Sing Chawla, Nidhi Goel, Balasubramanian Raman "Feature extraction and identification of indian currency notes" IEEE
[8] Zahid Ahmed, Sabina Yasmin, Md Nahidul Islam, Raihan Uddin Ahmed "Image processing based feature extraction of Bangladeshi banknote" 2014 IEEE
[9] Binod Prasad Yadav, C. S. Patil, R. R. Karhe, P. H. Patil, "Indian currency recognition and verification system using image processing" 2014 IJARCSSE
[10] D. Alekhya, G. Devisuryaprabha, G. Venkata Durga Rao "fake currency detection using image processing and other standard methods"
[11] www.rbi.org.in
[12] LabVIEW for Everyone: Graphical Programming Made Easy and Fun, Third Edition, by Jeffrey Travis, Jim Kring
[13] IMAQ NI Vision Assistant Tutorial

©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)