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Forensic Analysis of Security Features in Indian Currency Denomination Of ₹500 Authentication and Recognition Through Docucenter Nirvis Instrument

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Abstract

India is a developing country and this Recent year many high-tech and advancements are made to counterfeit currency like scanning, color printing, color photocopy counterfeiting difficulties have become major serious issue. After demonetization Reserve Bank of India print new currency note. The official currency of the Republic of India is "Indian Rupee. Production of currency without the legal authorization of Government is termed as Counterfeit money or Fake currency. Due to rapid development in scanning, printing and imaging technologies, fake currency is one of the most problematic hurdles in the "hard cash transactions". Today with the help of advanced software and hardware tools it is quite easy for a person to create fake currency notes. The recognition and authentication of currency has many potential applications such as E-banking, currency monitoring system etc. The motive of this research paper is to explore the security features of the highest denomination. Fake notes of the denomination ₹500 is a very difficult process because of many hard to copy security features embedded in the new currency notes, which makes the currency of highest denomination more secure.

Keywords: Currency Notes; Counterfeit; Security Features; Genuineammunition; Crime scenes

Introduction

Progress in the current banking facilities, automatic systems for recognition of currency paper becomes very important in various applications such as in computerized teller machineries and automated goods seller machineries. The needs for recognition of currency note are automatic systems stimulated many scientist and researchers to advance equivalent robust and reliable methods. Recognition of fast processing and accuracy are commonly two significant targets in such structures. Innovation of the financial structure is a milestone in defending the economic prosperity and maintaining social harmony. Automatic machines are made for recognizing banknotes massively used in automatic dispensers of a number of different products, ranging from cigarettes to bus tickets, as well as in many automatic banking operational processes. The needs for automatic banknote recognition systems encouraged many researchers to develop corresponding robust and reliable techniques [1-5]. To fake intends to wrongfully make an impersonation of something with the purpose to exploit the prevalent estimation of the imitated item. Fake cash alludes to money that nearly look like the first money of a nation yet that is delivered without the legitimate authorize of the administration. Fake cash is unsafe to a country. Fake notes increment cash dissemination, conceivably prompting to swelling [6-8]. This paper essentially concentrates on the remarkable elements of money notes made for security reason and can help the layman to comprehend that straightforward mindfulness identified with notable elements of new monetary forms can help them to anticipate themselves of being casualties to forgers. In a important stride to check undeclared dark cash, the Government of India on the 8 November, 2016 declared demonetization of ₹500 and ₹1000 banknotes with impact from that day's midnight making these notes invalid. The Indian 500-rupee banknote is of the most noteworthy division of Indian money. It was initially presented by Reserve Bank of India in November 2016. Indeed, even as ₹500 notes printed by the Reserve Bank of India (RBI) are yet to achieve banks all over the place, a fake note of this section has surfaced many places of India. The fake notes found

in different parts of the nation were photocopied adaptations, this note had highlights including the Gandhi watermark alongside the national image and a fake security string [9,10].

Material and Methods

Investigation of several security features in new denomination of Indian currency arranged by Reserve Bank of India. New Currency note of denomination ₹500 was selected for present study. Several types of security features were identified on paper currency note using different lights ranges, by using different lights, magnification ranges and various filters. In these ranges several security features were analyzed. All security features are analysis through Docucenter Nirvis Instrument.

Result & Discussions

New Security Features of ₹ 500 notes (Figure 1 & 2) As per RBI, the new series of banknotes i.e. MAHATMA GANDHI SERIES will have letter "E" inserted in both the number panels in ₹ 500 denomination banknotes.

Figure 1: Security features on the Front of the ₹500 Banknote.

Figure 2: See-through register in denominational of ₹500 in numeral.

Front side feature of ₹ 500 currency note

Figure 3: 5 bleed lines.

a) bleed lines both sides as shown in Figure 3.

b) Increasing order of Number Series as shown in Figure 4.

Figure 4: RBI Increasing order numeral Series.

c) Micro lettering of Denomination ₹500 as shown in Figure 5.

Figure 5: Micro letters of Denomination ₹500.

d) Denomination of ₹ 500 in Intaglio Printing as shown in Figure 6.

Figure 6: Denomination of ₹500 in Intagli Printing.

e) Anti-Coping Feature as shown in Figure 7.

Figure 7: Anti-Coping Feature.

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f) Latent Image of Denomination ₹ 500 as shown in Figure 8.

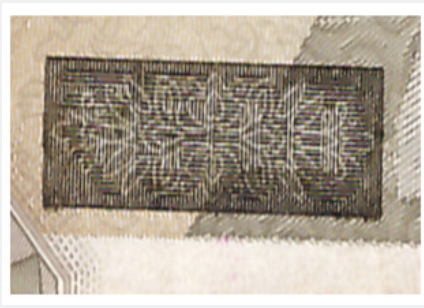

Figure 8: Latent Image of Denomination ₹ 500.

g) Micro lettering Written on the left stick of speck reading as RBI as shown in Figure 9.

Figure 9: micro lettering RBI Written on the left stick of speck RBI.

h) Security thread in 6 segments with features of colour changing from green to blue when the note is tilted and when observe under UV light its continuous security threat with fluorescence of yellow color as shown in Figure 10.

Figure 10: Security thread with 6 inscriptions optical variable ink are used to a color changing from green to blue when the note is tilted and under UV light show full security threat in yellow color.

i) RBI logo on front side have two color as shown in Figure 11.

Figure 11: Optical variable ink is used in RBI logo which changes colour from green to blue when the note is tilted.

j) Optical variable ink is used in ₹500 which changes color from green to blue when the note is tilted as shown in Figure 12.

Figure 12: Denomination of ₹500 are used optical variable ink & Identification marks in top of Ashoka pillar in the shape of Circle with ₹ 500 in raised print on the right.

k) Water mark of Mahatma Gandhi's Portrait as shown in Figure 13.

Figure 13: Water mark of Mahatma Gandhi Portrait.

l) Identification marks in the shape of Circle with ₹500 in raised print on the right as shown in Figure 14.

Reverse side feature of ₹500 currency note.

i. Language panel showing fluorescence under 350nm UV light as shown in Figure 15.

ii. Optical fibers giving fluorescence under 365nm UV light as shown in Figure 16.

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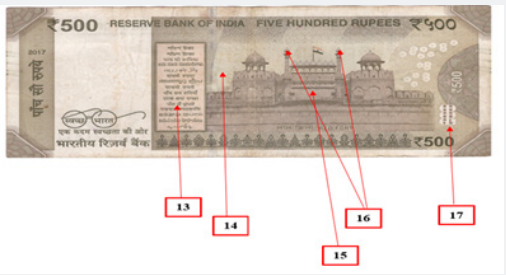

Figure 14: Security features on the Reverse Side of the ₹500 Banknote.

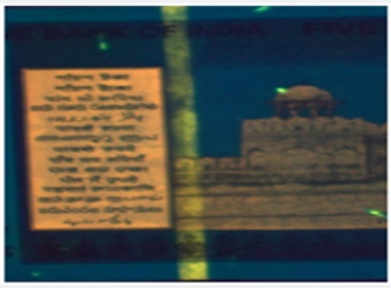

Figure 15: Language panel showing fluorescence under 350nm UV light.

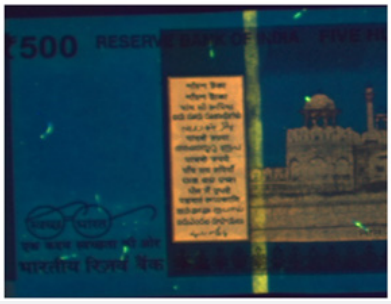

Figure 16: Optical fibers giving fluorescence under 365nm UV light

iii. Micro letters printing of INDIA BHARAT INDIA as shown in Figure 17.

Figure 17: Point Shows Red fort both pillar of top is printing Smiley.

iv. Red fort both pillar of top is printing Smiley as shown in Figure 17.

v. See-through register in denominational of ₹500 in numeral as shown in Figure 18.

Figure 18: Micro letters printing of INDIA BHARAT INDIA.

Conclusion

Various genuine features of Indian currency of denomination ₹500 are examined through this research, using Docucenter Nirvis instrument to study various genuine features as per the RBI guidelines. This research finding was very helpful in various govt agency like banks, forensic science laboratory, legal authority's currency exchanges office and many private organizations. This research will be helpful in differentiating between the real and fake currency.

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