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Counterfeit Currency Detection and Recognition for Blind People

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Abstract: *Counterfeit currency detection and recognition technology is a crucial tool to empower blind and visually impaired individuals in managing their finances independently and securely. In an increasingly digital and cashless world, ensuring that these individuals can confidently identify genuine banknotes and protect themselves from counterfeit currency scams is of paramount importance. This abstract explores the challenges faced by blind users, the technology's potential, and the ongoing efforts to enhance accessibility and usability. Blind and visually impaired individuals encounter significant hurdles when dealing with currency, from counting money to ensuring its authenticity.*

Keywords: Machine Learning , Artificial intelligence, CNN, Recognition

I. INTRODUCTION

In a rapidly evolving digital age, technology has the potential to empower and enhance the lives of individuals with various disabilities. For the visually impaired, mobile applications have become invaluable tools for navigating and accessing information. One such critical application is "Counterfeit Currency Detection and Recognition for Blind People." Counterfeit currency detection is a pressing concern, not only for the general population but also for those with visual impairments. Blind individuals face unique challenges when it comes to recognizing counterfeit money, as they rely on touch and trust when handling currency

II. SYSTEM ARCHITECTURE :

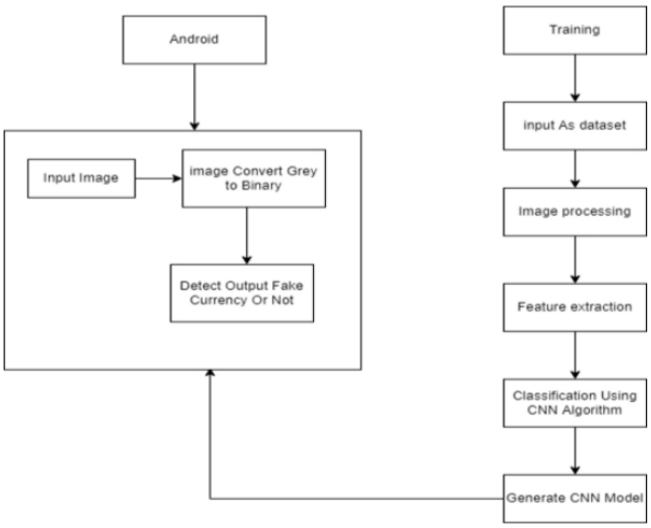

Figure: System Architecture

Module

- Admin
- In this module, the Admin has to log in by using valid user name and password. After login successful he can do some operations such as View All Users and Authorize.

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- View and Authorize Users
- In this module, the admin can view the list of users who all registered. In this, the admin can view the user's details such as, user name, email, address and admin authorizes the users.
- End User

Technology Used

Libraries :-

Android is a mobile operating system based on a modified version of the Linux kernel and other open source software, designed primarily for touch screen mobile devices such as smartphones and tablets. Android is developed by a consortium of developers known as the Open Handset Alliance and commercially sponsored by Google. It was unveiled in November 2007, with the first commercial Android device launched in September 2008.

It is free and open source software; its source code is known as Android OpenSource Project (AOSP), which is primarily licensed under the Apache License. However most Android devices ship with additional proprietary software pre-installed, most notably Google Mobile Services (GMS) which includes core apps such asGoogle Chrome, the digital distribution platform Google Play and associated GooglePlay Services development platform. About 70 percent of Android smartphones run Google's ecosystem; competing Android ecosystems and forks include Fire OS(developedby Amazon) or LineageOS. However the "Android" name and logo aretrademarks of Google which impose standards to restrict "uncertified" devices outside their ecosystem to use Android branding.

III. ALGORITHM USED

CNN:

A Convolutional Neural Network (CNN) is a deep learning model specifically designed for processing structured grid data, such as images and videos. CNNs are highly effective in tasks related to computer vision, including image classification, object detection, facial recognition, and more.

CNN Algorithm Working Steps:

Step1: Import TensorFlow.

Step2: Download and prepare the dataset.

Step3: Verify the data.

Step4: Create the convolutional base.

Step5: Add Dense layers on top.

Step6: Compile and train the model.

Step7: Evaluate the model.

CNNs are designed to mimic the human visual system. They consist of multiplelayers, including convolutional layers, pooling layers, and fully connected layers. Convolutional layers apply filters to the input image, detecting local patterns. Pooling layers down sample the data, reducing its dimensionality. Fully connected layers make decisions based on the patterns detected.

IV. TYPE OF TESTING USED

Unit Testing:

It is the testing of individual software units of the application .it is done after the complexion of an individual unit before integration. Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal
code flow should be validated. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

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Integration Testing:

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

V. FUTURE WORK

Incorporating more advanced machine learning and artificial intelligence techniques can improve the accuracy and reliability of counterfeit currency detection. Expanding the technology's capability to support a broader range of international currencies and languages will make it more inclusive for blind individuals worldwide and for those who frequently travel.

Continued investment in research and development will lead to breakthroughs in this field. This includes exploring new sensor technologies, material sciences, and accessibility features.

VI. CONCLUSION

Counterfeit currency detection and recognition technology represents a significant step forward in enhancing the financial independence and security of blind and visually impaired individuals. This technology addresses a critical need, enabling these individuals to confidently manage their finances, protect themselves from financial fraud, and participate in everyday transactions without the need for constant assistance.

VII. ACKNOWLEDGMENT

It gives us great pleasure in presenting the preliminary project report on 'Counterfeit Currency detection recognition for Blind People '. I would like to take this opportunity to thank my internal guide Prof. Ugale. K.V for giving me all the help and guidance I needed. I am really grateful to them for their kind support. Their valuable suggestions were very helpful.

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