

RECOGNIZATION HOLIC- MEDICINE DETECTION USING DEEP LEARNING TECHNIQUES

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ABSTRACT

Everyone's life is significantly impacted by medicine. The rate at which a certain disease's treatment is discovered is rising daily. Therefore, it is important for people to be attentive when taking their medications and that they are knowledgeable about them. Providing various medication-related capabilities such as reminders to take medications on time, prescription information, and to aid chronic patients in taking numerous medications appropriately and avoiding taking the wrong medications, which may create drug interactions. The RECOGNIZATION HOLIC programme uses deep learning to create an intelligent system for identifying medications. By matching the text in the image with the dataset, which contains various drug names and their descriptions, the dataset can be displayed in this application. The scanned image is used to extract the text. By using an optical character recognition algorithm and tensor flow character training in the Android operating system, the text is recovered from the scanned image of the medication label. The reminder option with the medicine photo and the time to take their medicine is added into this application to help the people who might take the wrong medicine or forget to acquire the medicine. This software assists patients in taking their medications properly and at the ideal time.

KEYWORDS

Deep learning, Optical Character Recognition, Keras, Medicine recognition, Tensor Flow, recognition holic app.

1. INTRODUCTION

Nearly 480 million people in the 7.5 billion-person world suffer from chronic illnesses. The World Health Organization (WHO) reported that 1.4 billion chronic diseases were brought on by the elderly. Due to age and a decline in physiological function, elderly persons run the risk of taking the incorrect medication. The WHO also stated that improper drug usage accounts for one-third of all fatalities worldwide. The patient is not aware of the medications they took. Due to the enormous range of medications used by patients, classifying them is a more difficult task, and misclassifying a medication increases the risk of taking the incorrect medication. An application that uses character recognition to find the name of the medication and provides a description of how the medication is used to treat the disease. With tablet photos and the current time, this programme reminds the user when to take their medications. It also offers a multilingual voice description option.

The user should use a mobile camera to take a picture of the tablet label first. In order to integrate photos into the programme, android API is added. Java is the language utilised in this case, and the software application employed is called Android Studio. The tablet name from the image is then displayed in text form by training the application with character recognition. For character recognition training, we use Tensor Flow and Android's Keras package.

The language used here is Python and the tool used is Anaconda. When you find the drug name, this application will show the drug description. This is possible by matching the drug name to the record and retrieving the information from the record. Store and retrieve data using Firebase.

Firestore stores the names of medicines and the ailments they are used to treat. The application also delivers Google Cloud Text-to-Speech API descriptive voice messages on Android with multilingual options. This application has the advantage that the user can set the rest with a picture and time on the tablet so that it can be reminded when to take the medicine. This application helps people who want to take their medicine on their busy schedule.

2. RELATED WORKS

[1] This application is based on tracking and tracing wine bottles using computer vision to read serial numbers on wine labels. This application used the Tesseract OCR engine. The application has been tested to use real-looking images of wine serial numbers. [2] This paper proposed character recognition of Yi based on OCR. The system uses the jTeesBox editor to extract the Yi character and train on 900 images to preserve its writing features and thereby identify the correct character. This experiment gives an accuracy of 85.9%. [3] The application uses optical character recognition to extract information from invoices, extract information from receipts from images, open resumes for text extraction and image processing respectively.. [4] This application is intended for complex industrial environments, methods for detecting and recognizing characters on the surface of metal workpieces. The results show a detection rate of 98.6% and high efficiency and performance. [5] This system aims to acquire content and summarize visual information from images. This application uses text localization, segmentation, and binarization techniques to extract text. [6] The system tackles offline learning of Kannada handwriting by optical character recognition and learning between different machine learning and deep learning models. The model achieves 5% accuracy. [7] The system is based on a neural network of offline Latin numerals and alphabetic characters, where characters are extracted from images and given as input to the neural network for the recognition process. The neural network is trained using 19,422 sample alphabets and 7,720 numbers written in 150 handwriting styles. [8] This document describes how OCR works at different stages to identify various shortcomings of traditional systems. [9] This application uses MATLAB's Neural Network Toolbox to recognize letters, numbers, and special characters. The accuracy of this application depends on the input resolution. [10] This paper addresses data, efficiency, and integration challenges by adding HTR capabilities for multilingual OCR systems. This application introduces the possibility of integrating HTR models into his OCR system and demonstrates the accuracy of LSTM-based models.

[11] The paper aimed to create a pillbox for visually impaired patients to take drugs that achieved a 100% success rate. [12] The system uses an OCR deep learning approach to analyze how pages score and recognize Bengali text documents.. [13] Software that ranks pills using consumer prescription pill images that match reference pill images in the RxIMAGE library. The software takes consumer-quality images as input and produces the top 5 correct images with 43%, 12%, and 11% probability after training on a dataset of 5000 consumer images. [14] This medicine chest recognition system uses a three-step approach of barcode recognition, text recognition and feature matching technology, and uses a camera attached to the device to identify the medicine chest and recognize the medicine with an 80% success rate. Used to provide information. [15] The deep learning model aims to identify blister-filled drugs with over 90% accuracy using traditional computer vision solutions. [16] An automatic tablet recognition system uses the imprint extraction and description part to use the imprint information as an algorithm. In footprint extraction, this system-modified stroke-width transform is employed for coherence, and image segmentation by loopy belief propagation is added to incoherence. Detailed impression description uses a new descriptor called the two-level sampling distance set. This gives us a match accuracy of 90.46%.

3. PROPOSED METHODOLOGY

3.1. Optical Character Recognition Algorithm (OCR)

This project uses an optical character recognition algorithm to recognize characters. The general purpose of OCR is to convert typed, handwritten, or printed text images into text form. This project primarily uses his OCR algorithm to convert text from pharmaceutical label images. Prediction to recognize characters is a trivial task, because to use the OCR algorithm, the images must be preprocessed images to train the characters. Therefore, the image of the drug label is the input. This pharmaceutical label scanning application incorporates Android API functionality. It can be viewed as a preprocessed image for character recognition.

3.2. Firebase

Firebase is a backend as a service. We provide developers with a variety of tools and services that help them build quality apps, grow their user base, and generate revenue. It is based on Google's infrastructure. Firebase is classified as a NoSQL database program that stores data in JSON-like documents. Explicitly store drug names and their descriptions in the dataset. Store and retrieve datasets using Firebase. If the text and drug name match in the record, the user will see the drug description.

3.3. Text-to-Speech (TTS) Algorithm

This text-to-speech is used to convert text into voice messages. This is an additional feature we added to this paper because it's easier to remember a drug's name by hearing it than by seeing it. Get the drug description after predicting the text from character recognition. This is considered input to the text-to-speech algorithm. This description is provided in verbal format.

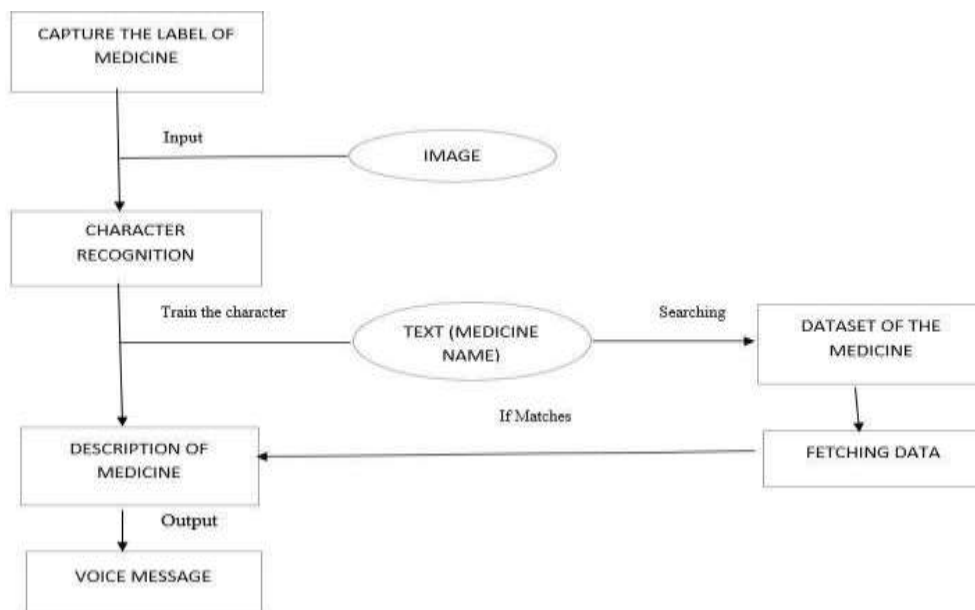


FIGURE 1. Architecture of Text to Speech Recognition Architecture

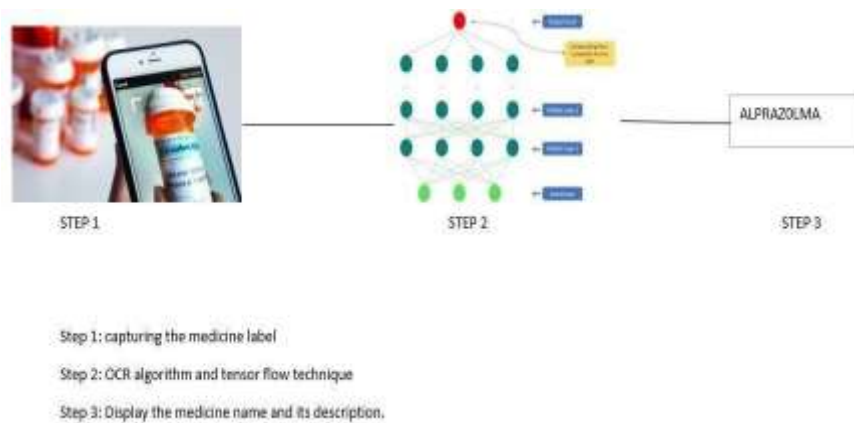


FIGURE 2. Image Recognition in Mobile App

4. SOFTWARE IMPLEMENTATION

Deep learning is the concept of learning data from inputs by using algorithms to train neural networks. Using a neural network consists of training the network to recognize text, images, etc. By concluding the above statements, this application is based on the concept of deep learning and specifically provides training for recognizing images that are pharmaceutical labels for this application. Deep learning he consists of three layers. H. An input layer that receives images as data, a hidden layer that is used to train on the data, and an output layer that produces prediction outputs.

Tensor Flow is an open-source library used for training networks in deep learning. A library that provides a high-level API so that the library itself can do all the work without preparing a network or program for Neuron or configuring Neuron. The text font is different for each drug label image. Here, tensorflow with the Python language plays a major role by training it for that task. Keras is an open source library that serves as a Python interface for the Tensor Flow library. Here, Keras is considered one of the metrics for this application because using Keras with Tensor Flow is much easier to implement and minimizes the number of user actions. This application takes an image of a drug label as input, uses Keras to train Tensor Flow on the image, and uses an OCR algorithm to predict text from the image, which is the name of the drug.

Android Studio is an integrated development environment (IDE) for developing Android applications. Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on top of JetBrains' IntelliJ IDEA software and designed specifically for Android development. Designed specifically for Android, it speeds up development and helps you create top quality apps for any Android device. It offers tools specifically tailored for Android developers, including extensive code editing, debugging, testing, and profiling tools. Downloads are available for Windows, Mac OS, and Linux-based operating systems. It replaces the Eclipse Android Development Tools (ADT) as the leading IDE for developing native Android applications. The official language for Android development is Java. Most of Android is written in Java, and its API is primarily developed in Java. The rest of the options and voice message delivery are done using Android Studio using the JAVA language.

Anaconda is an open-source platform dedicated to scientific approaches, primarily data science, data processing, machine learning approaches, and large-scale data processing.

Anaconda is installed with Jupyter Lab, Spyder Notebook. The Jupyter box is booted with Anaconda software. These documents are an ideal place to put together an analysis description and can be used to perform real-time performance using data analysis. Therefore, the Anaconda platform uses Tensor Flow and Keras libraries.

5. RESULT AND DISCUSSION



FIGURE 3. Front Page of Mobile App with Detection and Remainder Switch

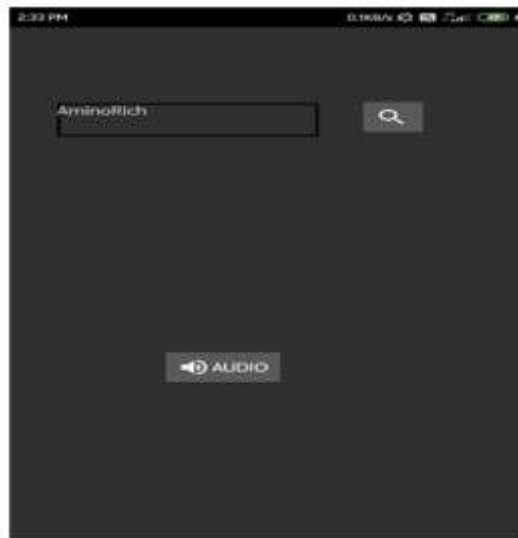


FIGURE 4. Detection Page



FIGURE 5. Recognition of Medicine Text Image

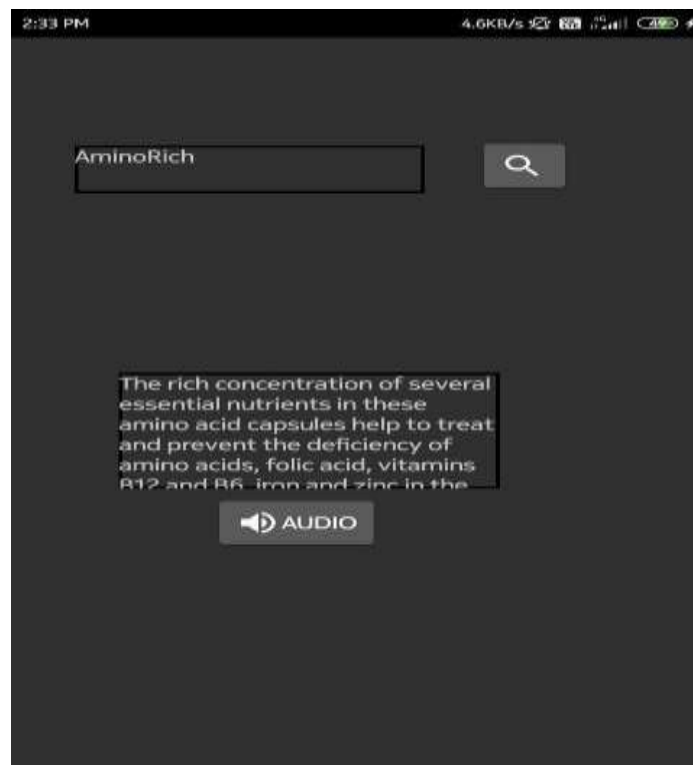


FIGURE 6. Retrieval of Medicine Description



FIGURE 7. Remainder Page

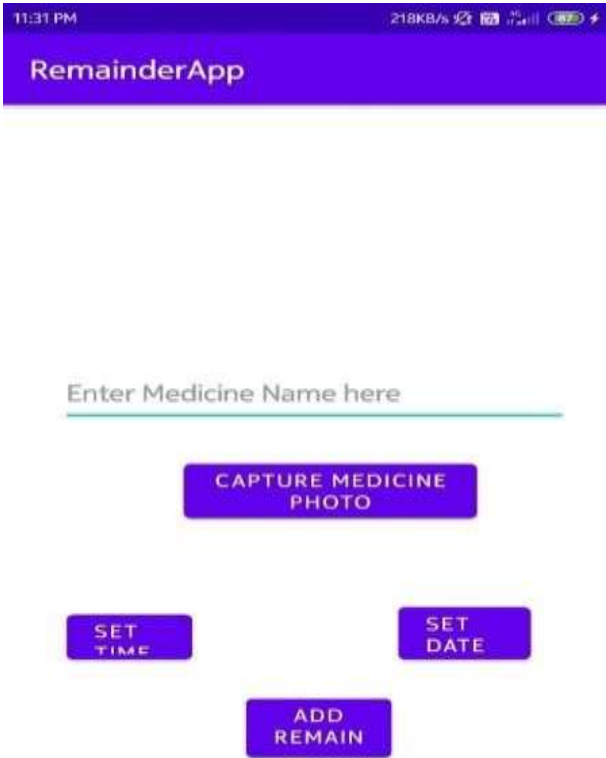


FIGURE 8. Features of Remainder Page

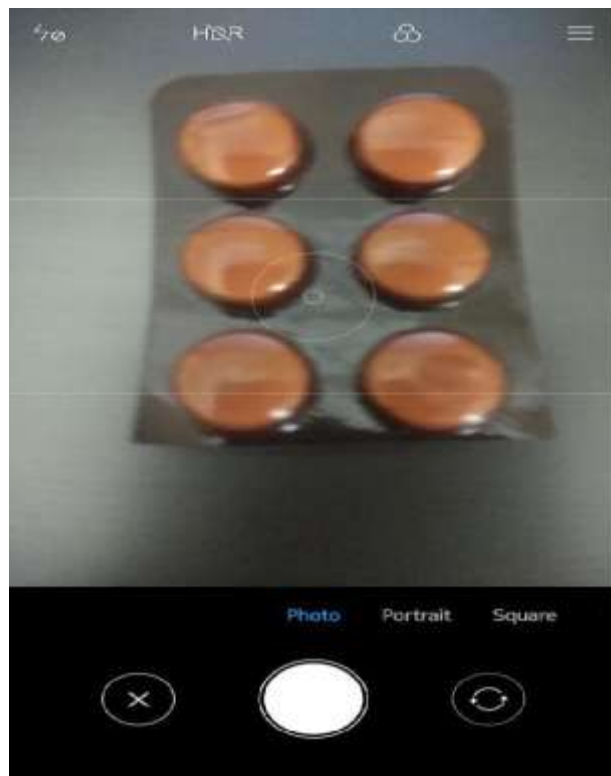


FIGURE 9. Recognition of Medicine Image



FIGURE 10. Creation of Reminder for Recognized Medicine

6. CONCLUSION

The proposed system takes into account that the relevant data for this application are medicines for various ailments of patients. Using deep learning technology for given input data, the drug name is recognized by optical character recognition character analysis, and the drug name and its explanation are displayed. The dataset contains a large number of drug names taken daily by patients. The system can notify patients of medication times and provide medication photos on their Android phone. As a result, chronic patients do not have to worry about forgetting to take their medicine. The proposed system can reduce the problem of wrong medication, thereby providing a safemedication environment for chronically ill patients.

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