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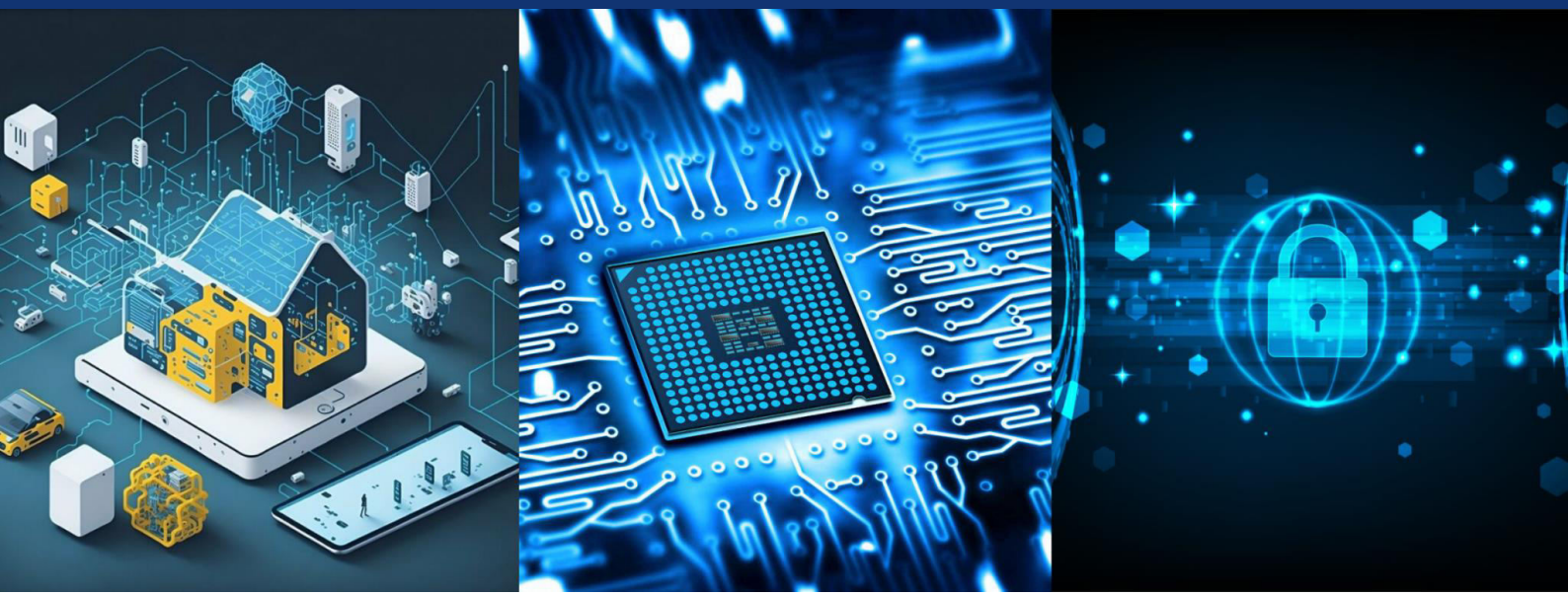

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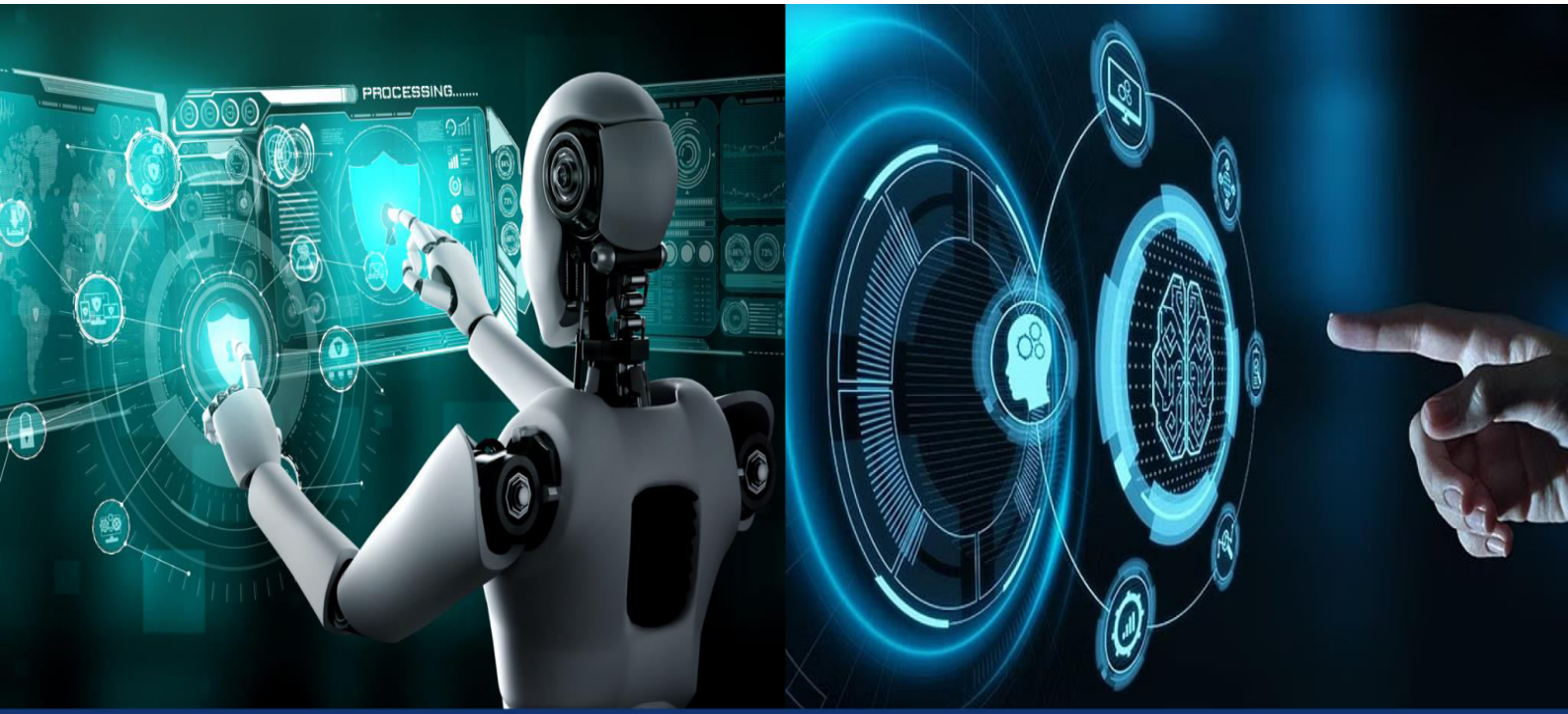

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Mediocr "Doctor's Handwritten Prescription Recognition using Deep Learning"

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ABSTRACT: The healthcare sector faces significant challenges because prescriptions are easy to print, leading to a high risk of incorrect ineffective medications. Inefficiencies in medication management concern patients, doctors, and pharmacists alike and need to be addressed. This study demonstrates the development of applications based on deep learning and optical character recognition (OCR) to accurately transcribe written text. The system uses the best neural network techniques to recognize and interpret various types of writing, enabling humans to be more accurate in the writing process. The application also provides information on drug-drug interactions to detect adverse reactions and provide instant alerts to doctors. This solution is designed to improve the accuracy and efficiency of medication administration, thereby improving patient safety and increasing the work efficiency of doctors and pharmacists. By addressing these important issues, the application has the potential to reform prescriptions in healthcare. The main objective of this project is to develop an interactive, intuitive application that empowers users to interpret their symptoms, gain insights into possible conditions, and access tailored medical advice. Users will be able to input symptoms directly into the app, which will then analyze these symptoms using a machine learning model trained on extensive symptom-disease mappings. Based on the predicted condition, the app will present users with relevant information on medications, necessary precautions, dietary recommendations, and suitable exercises. Additionally, the app integrates Optical Character Recognition (OCR) to read and interpret text from uploaded prescription images, helping users understand their doctors' handwritten instructions.

I. INTRODUCTION

In today's healthcare, relying on prescriptions causes serious problems, leading to drug misuse and adverse drugreactions.As patient care increases in complexity, the risk associated with medication misunderstandings also increases. Doctors, pharmacists, and patients are affected by the inefficiency in managing this guideline, indicating an urgent need for new solutions. The project plans to create an advanced application that combines deep learning and character recognition (OCR) technology to accurately record handwritten text in digital format. Leveraging a complex neural network architecture, the application not only aims to improve transcription accuracy, but also integrates a powerful drug interaction database to protect patient health. Through this initiative, we aim to transform the process of managing prescriptions and improve patient safety and healthcare performance.

II. LITERATURE SURVEY

Deep learning techniques have revolutionized several industries, and the medical field is no exception. These methods, particularly neural networks, have shown significant promise in applications such as medical image analysis, diagnostic prediction, and Convolutional Neural Networks (CNNs), OCR (Optical Character Recognition) and we used some of the maching learning algorithm like supervised machine learning it used to pedict the particular Symptoms.[1]Medical HandwrittenPrescription Recognition Using CRNN.(2019)

The approach established a Convolutional Recurrent Neural Network (CRNN) technology using Python that can interpret handwritten English prescriptions and translate them into digital text.

[2] Doctor's prescription recognition using deep learning Dr E Kamalanaban, M Gopinath.(2018)

The proposed Medicine Box system is a mobile application that uses a convolutional neural network (CNN) to recognize and translate handwritten medicine names from prescription notes.

[3] Handwritten Recognition using Transformer for Medical Prescription Zobeir Raisi, Mohamed (2019).

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Transformer-based architecture is used for handwritten text recognition since it preserves the spatial information within 2D images.

[4] Doctor's Handwritten Prescription Recognition System In MultiLanguage Using Deep Learning Pavithiran G, Sharan Padmanabhan, Nuvvuru Divya, Aswathy V, Irene Jerusha P (2022)

III. EXISTING SYSTEM

Google Cloud Vision API: Google offers a highly accurate OCR service that can read printed and handwritten text. It's often used in healthcare for digitizing documents, but it's cloud-based and requires a paid subscription for high-volume processing.

Microsoft Azure Cognitive Services: Azure offers OCR and forms recognition services, which can extract structured data from documents, including prescriptions. Like Google's API, it's highly accurate but comes with cloud service costs.

MediScan: An existing app that allows users to scan prescriptions and get details about the medicines prescribed. It simplifies the interpretation of medical terms but lacks a robust alternative recommendation system.

DocScanner: A mobile application that scans and digitizes documents, including prescriptions, but it doesn't offer detailed medicine guidance or dosage recommendations

IV.PROPOSED SYSTEM

Patients and healthcare providers face significant challenges in interpreting handwritten or complex prescriptions, leading to medication errors and inefficiencies. Unclear handwriting and unfamiliar medical terms increase the risk of incorrect dosages and hinder adherence, while manual processing is time-consuming and error-prone.

An automated solution is needed to digitize prescriptions, extract key medication details, and offer clear guidance on usage and alternatives. This would reduce errors, improve patient adherence, and streamline prescription management.

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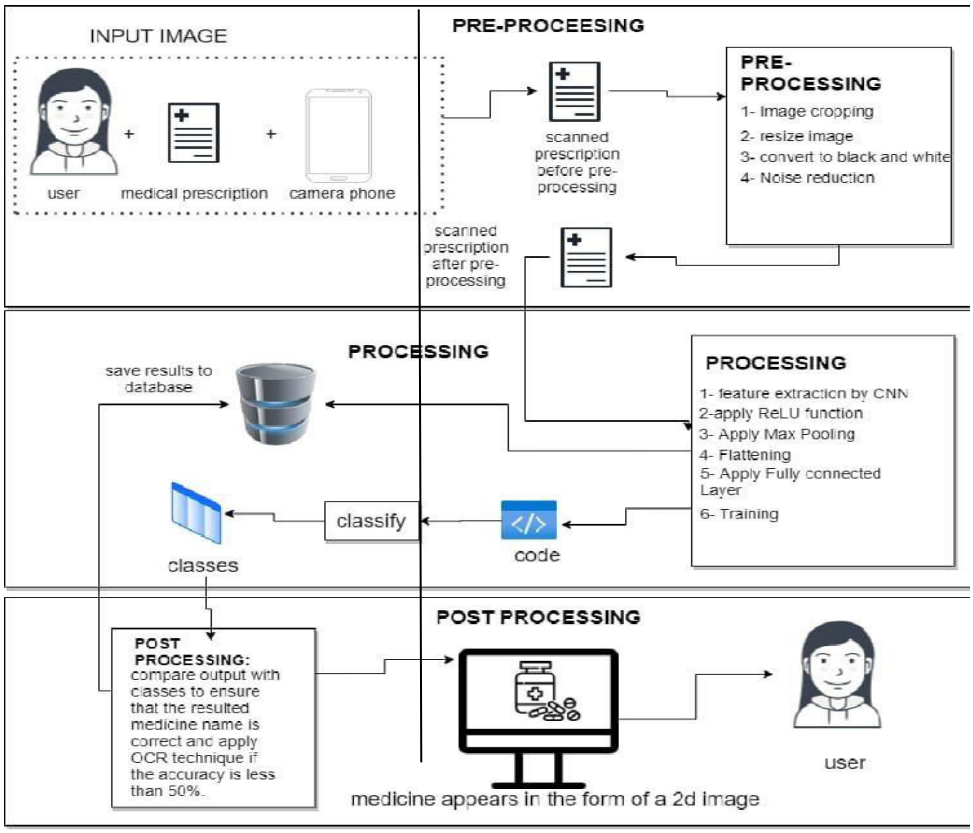

Fig (1)

V. FLOW OF APPLICATION

Input & Pre-Processing

In this initial stage, the user captures an image of a handwritten prescription using their phone camera. The captured image then undergoes pre-processing steps to enhance its quality and readability. These steps include cropping and resizing the image to focus on the relevant content, converting it to black and white to improve contrast, and applying noise reduction techniques to eliminate any distortions. This prepares the image for accurate analysis in the next stage.

Processing

In the processing stage, a Convolutional Neural Network (CNN) is used to extract essential features from the pre-processed image. The CNN model applies a series of transformations, including activation functions and pooling layers, to detect patterns in the handwriting and convert it into digital data. The processed data is then flattened and passed through a fully connected layer, which classifies the prescription contents. The classified results are stored in a database, ready for the next stage of validation.

Post-Processing

In the final stage, the application performs post-processing to ensure accuracy. It compares the classified output with known cases to verify that the transcribed medicine information is correct. If the accuracy is found to be below 50%, additional

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OCR techniques are applied to enhance reliability. Once verified, the recognized medication information is displayed to the user in a 2D image format for review. This final step ensures that the transcription is accurate, providing a reliable solution for digitizing handwritten prescriptions and reducing medication error

4. Data Sets used:

- symtoms.csv
- precautions.csv
- workout.csv
- description.csv
- medications.csv
- diets.csv

4. Future Scope:

Better Prescription Checking: Add features to check for dangerous drug interactions and suggest correct dosages.
Updated Medicine Information: Maintain a constantly updated list of medications and allow user feedback.
Mobile App Development: Create easy-to-use apps for smart phones with features that work offline.

VI.RESULTS AND DISCUSSION

The application deep learning techniques in the medical field has yielded impressive results in comparison to traditional methods, which could be considered more "mediocre" in terms of accuracy, efficiency, and scalability. Conventional approaches, such as manual interpretation by clinicians or rule-based systems, often fall short in dealing with the vast complexity and volume of data in healthcare. On the other hand, deep learning models, especially Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) and OCR.

Step 1: Home page for the Symptons Prediction and OCR Extraction

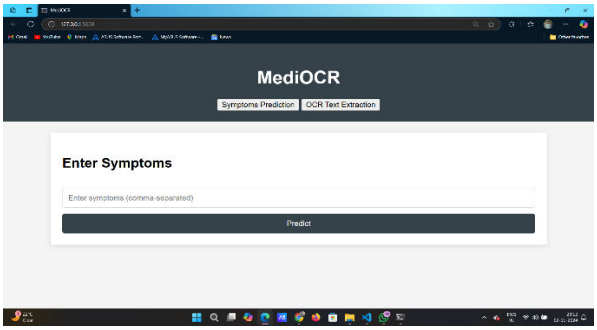

Fig (2)

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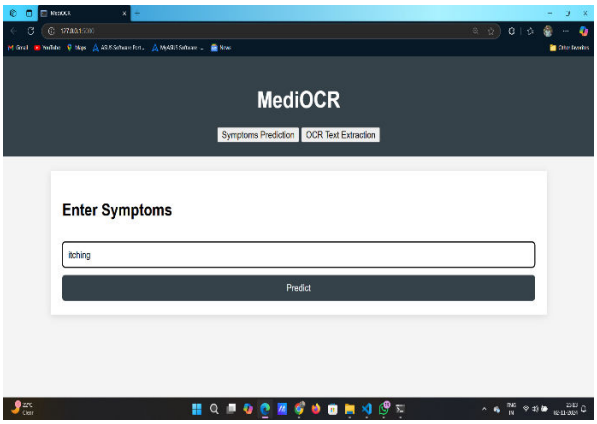
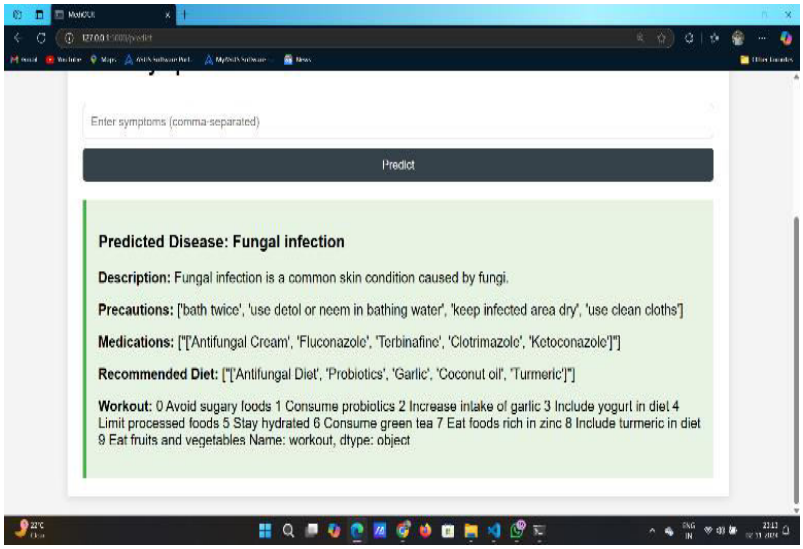
Step 2: click on the Symptons prediction then we get the enter the specific Symptons .



Fig(3)

Step 3: Click on the predict then we get predicted diseases with a specific disease description,precautions,medications and recommend diet and Workout .



Fig(4)

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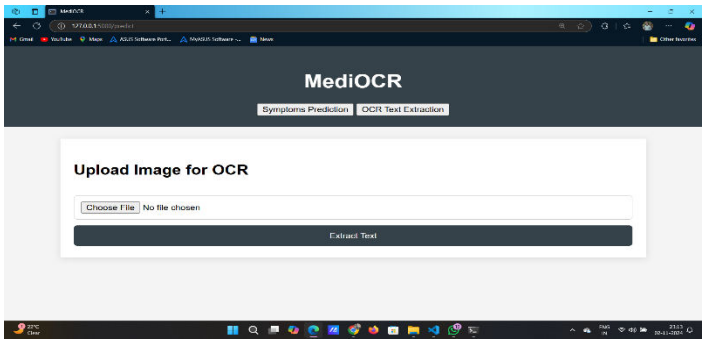
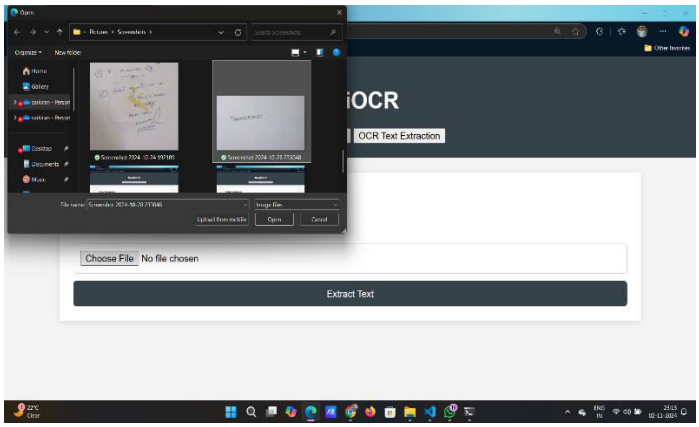
Step 4: Go to the home page click on the OCR Text Extraction we get the upload image.



Fig(5)

Step 5: click on the Upload image then go to the file and select specific prescription



Fig(6)

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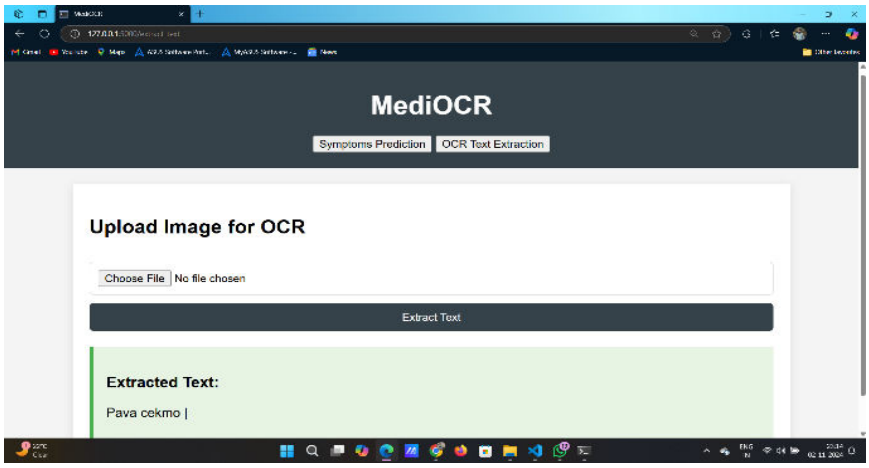
Step 6: This the final step Here we are going to extract Text.



Fig(7)

VII. CONCLUSION

In conclusion, utilizing deep learning for OCR (Optical Character Recognition) to recognize handwritten prescriptions in the medical field presents promising advancements. By leveraging convolutional neural networks (CNNs), recurrent neural networks (RNNs), and hybrid models such as CRNN (Convolutional Recurrent Neural Network), this approach can significantly improve the accuracy and efficiency of transcribing doctors' handwritten notes. Deep learning models can handle complex patterns and variations in handwriting, particularly for challenging scripts like those of medical prescriptions. This capability not only enhances the readability of prescriptions but also contributes to patient safety by reducing errors in medication dispensing.

The development of a robust OCR system for medical prescriptions requires extensive datasets with diverse handwriting samples for effective model training. Additionally, incorporating contextual understanding of medical terms and abbreviations, possibly through NLP (Natural Language Processing) integration, can further refine accuracy

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