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ANDRO Doctor Is an Android Application for Multi-Disease Prediction

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ABSTRACT: *Numerous people experience hair issues like dandruff, hair loss, and oily hair as a result of inadequate grooming, excessive levels of stress, an unbalanced diet, and a hazardous environment. Many people also suffer with some health issues such as skin diseases, diabetes. These are some of the problems people need to consult a doctor about and get appropriate treatment clear the problem, getting a doctor's appointment and consulting a doctor are the headache things in our daily busy life. To reduce this, the Android app is the clear solution. We designed an Android application that can predict diseases like skin diseases, diabetes, and hair loss. Services like scalp hair physiotherapy have become more popular recently as a means of treating these issues. This software suggests a technique for intelligent scalp examination and diagnosis that is based on deep learning. The categorization of skin disorders using picture data is the focus of our endeavor. They have been put into practice with the use of classifiers used in deep learning, such as convolutional neural networks. Diabetic prediction also helps to user to treat the disease in the early stage. It can store all the medical records of the user in one place and retrieve them when it is necessary. Female users can track their menstrual cycle, they will be reminded about ovulation days and fertile days.*

Keywords *– Deep learning, Android, Multi disease prediction.*

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I. INTRODUCTION

This project is titled "Andro Doctor an Android Application for Multi-Disease Prediction". It is very important to properly document and maintain the medical records of a patient and predict the disease in its early stages to provide further treatment. But it is becoming a difficult task to maintain medical records physically in one place. This method may cause several issues like missing documents, problems in treatment, and so on. It will become an issue for the doctor to treat the patient without studying his health history and records. Late detection of the diseases may lead to severe health complications and it may endanger the life of the patient. This project has been developed to store all the medical records in one place and use it whenever required and also to track the period cycle for women. It is also used to predict the diseases such as skin diseases, hair loss, and diabetes and their risk level to provide further treatment. Storing it in an Android application is an easy way to maintain the data rather than keeping physical data. It is a solution for issues raised in the management of medical records. It is a very useful application for women to store medical records and also track their period cycle in one place. Predicting diseases using an Android application is easy for the user and helps to provide treatment in the early stages.

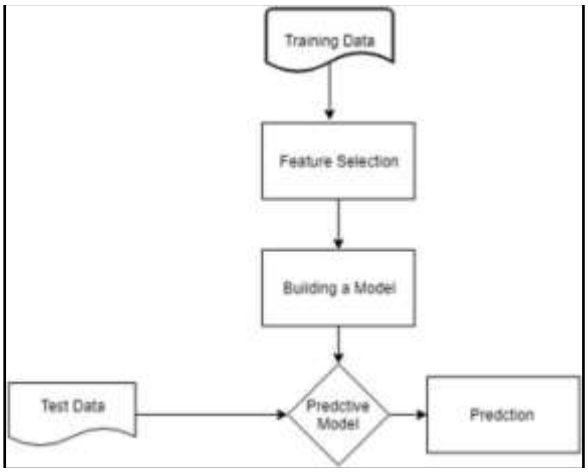


Fig.1: Example figure

The main feature of this project is that it stores the medical records and patient personal history in one place. It also detects the diseases such as skin diseases, diabetes, and hair loss. For women, it also stores details of their period cycle and reminds them about fertile days, and ovulation days. Some applications store medical records and a few other applications for tracking the period cycle of women. Some methods exist to detect and predict the risk level of the diseases but no Android application stores medical records that also track the period cycle for women and predict the diseases to provide further treatment.

II. LITERATURE REVIEW

Skin Disease Detection and Classification:

The skin, the outermost integument of the human body, plays a critical function in shielding our bodies from the sun, the cold, and other potentially hazardous chemicals and pathogens. Individuals have different skin types. Microorganisms and bacteria may thrive in a range of habitats because of the variation of human skin types. Occasionally visible symptoms of an underlying illness are also caused by skin abnormalities.

Thus, it is crucial to identify and correctly diagnose skin diseases in their early stages to stop the disease's progress. Our study uses picture data to classify skin conditions using image processing. Convolutional neural networks and MobileNet, two classifiers in the field of deep learning, have been used to implement these. As a result, this initiative serves as an early warning system that uses computer assistance to alert consumers to skin problems they may be experiencing.

Scalp Eye: A Scalp Hair Inspection and Diagnosis System for Scalp Health Based on Deep Learning:

Many people have scalp and hair issues including dandruff, folliculitis, hair loss, and greasy hair as a result of bad daily routines, an unbalanced diet, excessive levels of stress, and environmental toxins. In recent years, specialized treatments like scalp hair physiotherapy have evolved to treat these scalp issues. In this paper, a deep learning-based intelligent inspection and diagnostic system for the scalp, called scalp Eye, is proposed as an effective inspection and diagnosis system for scalp hair physiotherapy. The proposed scalp Eye system is made up of a mobile app, a cloud-based artificial intelligence (AI) training server, a portable scalp hair imaging microscope, and a cloud-based administration platform. In this work, we examined several well-known object identification models and used a Faster R-CNN with the Inception ResNet v2 Atrous model in the Scalp Eye system for picture recognition when examining and diagnosing symptoms of scalp hair.

Diabetes Prediction Using Various Machine Learning Methods:

The most serious disease in the world is diabetes. It is another creator of several different types of illnesses, such as cardiac failure, blindness, urinary organ ailments, etc. In these situations, the patient must go to a diagnostic facility to receive their findings following consultation. Also, predicting the illness at the outset benefits the patients and is crucial. Through information withdrawal, it's possible to exclude hidden information from a lot of diabetes-related data. The goal of this investigation is to create a system that might more accurately estimate a patient's level of diabetes risk.Model creation is based on categorization techniques like SVM, ANN, Decision Trees, and Naive Bayes. The models provide precisions of 85% for Decision Tree, 77% for Naive Bayes, and 77.3% for Support Vector Machine. Results demonstrate a substantial level of procedure

accuracy.

Textural feature extraction for the detection of facial skin diseases:

By leveraging the textural features in digital photographs of facial skin, this study intends to develop a model for the diagnosis of disorders of facial skin. The model is a rather expensive first automated screening device for face skin that may be utilized before pursuing subsequent diagnosis procedures. The textural aspects of the digital image of a face are extracted to obtain characteristics. Depending on the degree of each facial condition, texture features will identify its class. The Gray Level Co-Occurrence Matrices (GLCM) approach combined with the K-Nearest Neighbor classification algorithm is used to extract textural information. 150 digital photographs of troublesome faces were utilized as the facial image data; 70% of them were used as training data and 30% as reference photos. At a 20% error rate, this study generates a model accuracy of 80%.

Deep Learning in Skin Disease Image Recognition:

Deep learning techniques' use in illness diagnosis has recently emerged as a new area of study in medicine. One of the most prevalent illnesses in medicine is a skin disease, and compared to other diseases, skin disease is more visually evident. Hence, using deep learning techniques for the identification of skin diseases is very important and has caught the interest of scientists. In this study, we examine 45 research projects that have been conducted since 2016 on the diagnosis of skin diseases using deep learning technology. We evaluate this research in terms of the illness kind, data set, data processing technology, data augmentation technology, a model for identifying skin diseases from images, a deep learning framework, evaluation metrics, and model performance. Also, we list the conventional and machine learning-based ways of diagnosing and treating skin diseases. We also assess the current state of this field's development and forecast four potential routes for future study. Our findings demonstrate that the deep-learning skin disease picture identification approach outperforms dermatologists and other computer-aided treatment methods in the diagnosis of skin diseases. The multi-deep learning model fusion method in particular has the greatest recognition impact.

Menstrual Period Calendar Software:

The answer to a woman's requirements during her period is discussed in this essay. In this article, Vidhi Chalke, Gourvi Kala, Shruti Kadam, and I discuss a smartphone app we developed as a senior-year project. The app is called KNOW YOUR DATE. Finding the best period tracker software is a worthwhile endeavor since everyone who has had a period will attest to how challenging the process can be. Even if your period is regular, it still likely includes a variety of symptoms, such as mood swings, acne, bodily aches, and other issues. Understanding your cycle as much as you can is extremely beneficial if you struggle with a reproductive condition like endometriosis, fibroids, or polycystic ovarian syndrome (PCOS). In other words, if you're a woman or guy who has periods, a period app could help.

System for managing personal health information and its use in referral administration:

We created a web-based personal health record (PHR) that patients can use to gather and manage their health information (such as their medical history, previous operations, prescriptions, and allergies), make self-referral requests, and keep track of their consultations. A messaging system that may be integrated into the referral management procedure and also for more open communication is also included in the PHR. 61 participants participated in a pilot trial. A poll of 32 patients revealed that 94% of participants were happy with the total online referral procedure and 85% of responders with the usability. The consulting doctors considered the referral problem descriptions and the individuals' personal health information to be of sufficient quality and detail to triage all requests for referrals. Patients, doctors, and patient care coordinators all stated that the technology improved their communications and made the messaging feature easy to use.

III. METHODOLOGY

A statement for health care problems can be written as storing the patient’s personal history, medical history, and other details in one place, storing the period cycle details for women, and predicting diseases and their risk levels for further treatment. It gives paperless treatment and easy access to the patient’s medical records.

There are a few applications that collect the patient’s personal information, and health history and store them in one place. Some methods exist to detect diseases and their stages which helps the doctor to analyze the patient’s condition and provide further treatment. But these applications will not track the menstrual cycle of

women and remind them about fertile days, and ovulation days. All the features are not present in a single application.

Disadvantages:

- No application tracks men's and women's health separately.
- Complete tracking of women's health including menstrual cycle is not available in any application.
- Some of the data needs to be entered manually.
- There is no single application to detect all diseases and predict their risk levels.

This project can be considered as a health care app that can collect and store the data of the user such as user personal details, and health history in one place and retrieve them when it is necessary which helps the doctor for further treatment. It also detects diseases such as skin diseases, diabetes, and hair loss and predicts their stages to provide further treatment. It stores the menstrual cycle details of women and reminds them of fertile days, and ovulation days.

- Management of medical records will be easy.
- Paperwork will be reduced.
- Women's complete health details will be stored in one place.
- It reminds the user about doctor appointments and period cycles for women.
- Men's and women's health will be stored separately.
- Anywhere and anytime we can access the records.
- All diseases can be detected in one place.

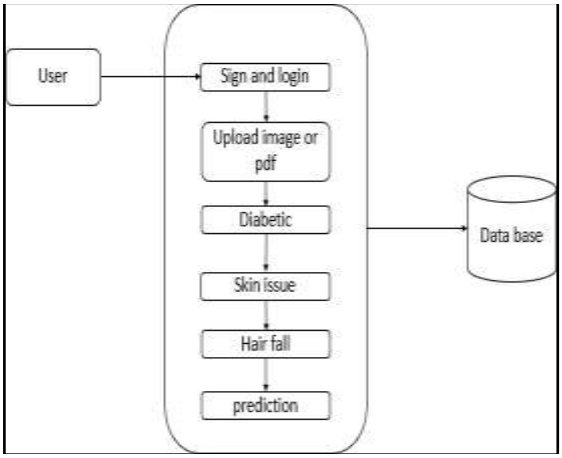


Fig.2: System architecture

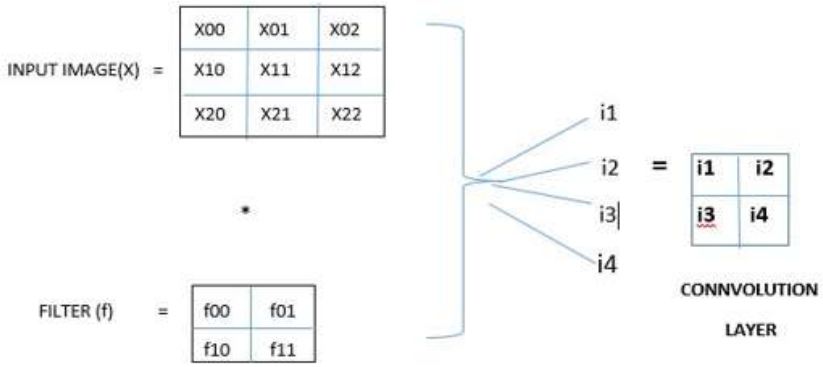
This project is based upon storing a person's medical record in one place and detecting diseases such as skin diseases, diabetes, and hair loss and predicting their risk levels. The model is built to store the data in the database and retrieve them when it is necessary and predict the risk level of the diseases. It uses a few libraries such as Storage Reference and Upload Task. Each library is used for a specific purpose for example Storage Reference is used to store the medical records and Upload Task is used for updating the information. The database used is Hostinger.

IV. MATHEMATICAL REPRESENTATION

MATHEMATICAL REPRESENTATION

Convolution is often represented mathematically with an asterisk * sign. If we have an input image represented as X and a filter represented with *f*, then the expression would be:

$$Z = X * f$$



DIMENSIONS OF THE MATRIX = ((n-f+1), (n-f+1))

FULLY CONNECTED LAYER

LINEAR TRANSFORMATION

$$Z = W^T.X + B$$

$$Z = \begin{pmatrix} W11 & W21 & W31 & W41 \\ W12 & W22 & W32 & W42 \end{pmatrix} \begin{pmatrix} X1 \\ X2 \\ X3 \\ X4 \end{pmatrix} + \begin{pmatrix} B1 \\ B2 \end{pmatrix}$$

$$Z = \begin{pmatrix} W11.X1 + W21.X2 + W31.X3 + W41.X4 \\ W12.X1 + W22.X2 + W32.X3 + W42.X4 \end{pmatrix}$$

ACTIVATION FUNCTION

$f(X) = 1/(1+e^{-X})$ {SIGMOID FUNCTION RANGES BETWEEN 0 – 1}

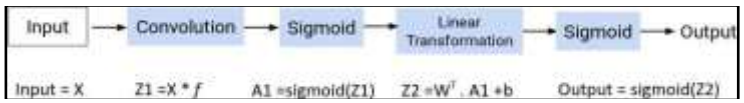


Figure 3: Summary

V. EXPERIMENTAL RESULTS

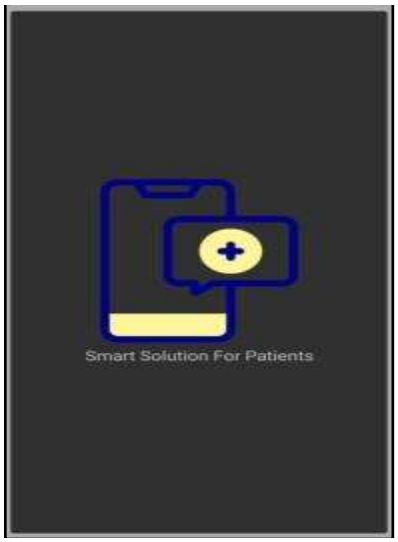


Fig.4: Opening Screen

Fig 5: Login page

Fig 6: Sign-up page

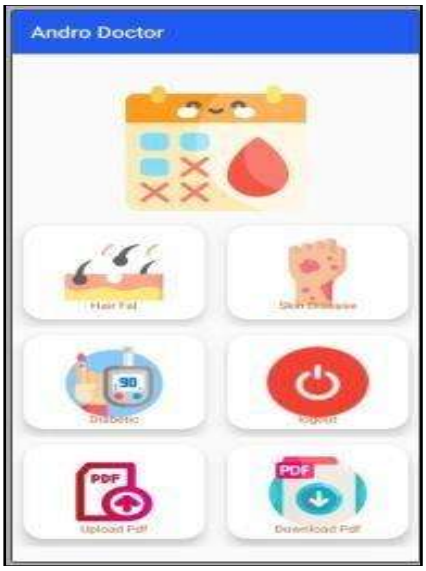


Fig 7: Main Screen

Fig.8: Menstrual Cycle input page

Fig.9: Calendar View

Fig 10: Uploading document screen

Fig 11: Retrieving document

Fig 12: Hostinger storage

Fig 13: Skin Disease Prediction


Andro Doctor
[other]
Treatment
Detect

Fig 14: Skin Disease Prediction

Fig 15: Skin disease treatment

Fig 16: Skin disease treatment

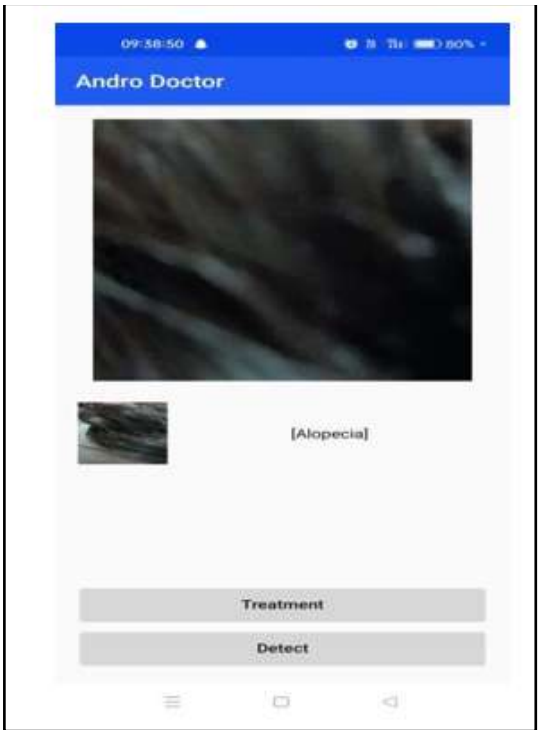


Fig 17: Hair Disease Prediction

Fig 18: Hair Disease Prediction

Fig 19: Hair disease treatment

Fig 20: Diabetes Prediction input

Fig 21: Diabetes Prediction input

Fig 22: Diabetes Prediction Output

Fig 23: Diabetes Prediction Output

VI. CONCLUSION

This project is an application that stores the personal information, laboratory tests, health history, and other key information of the user in one place. It can track the menstrual cycle of women which will be useful to examine the complete health history of the patient. It can also detect diseases such as skin diseases, hair loss, and diabetes and their risk level and provide further treatment according to it. It will be useful for the doctor to the examine previous health history of the patient easily and providing treatment to the patient at early stages will increase the chances of early recovery. It will reduce the paperwork and provide multi-disease treatment in one place.

FUTURE WORK

The future scope of the project can include:

1. Scheduling online sessions with doctors for clarification of any queries.
2. Additional features like verification of data in which data will be verified during storing and will be uploaded only if it is valid data.
3. Providing details of nearby pharmacy stores for purchasing medicines, injections, etc.
4. Detecting the Mediclaim policies taken by this number and providing the details to the doctor in case of emergencies.

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