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AI-Assisted Prediction on Potential Health Risks

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Abstract: *Mining and Machine Learning plays most motivating space of exploration that become generally well known in wellbeing association. It likewise has a crucial impact to reveal new examples in therapeutic science and administrations affiliation which subsequently obliging for every one of the gatherings related with this field. This undertaking expects to frame a symptomatic model of the normal sicknesses dependent on the manifestations by utilizing information mining method like arrangement in wellbeing space. In this paper, we will utilize AI calculations and profound realizing which can be used for health care diagnosis. In this paper we are proposing the disease identification using symptoms and images of malaria cells. Chest x-ray images of covid and pneumonia disease using CNN algorithm and we get the accuracy 89.45% at 50 epochs. Accordingly, we are recommending the precautions and hospital to the patient. This system also creates and take appointment which is helpful for doctor and patient.*

Keywords: CNN Algorithm, SVM, KNN, etc.

I. INTRODUCTION

Human is master in getting data, while machine is master at communicating and handling information. In this paper, we propose a model for patient side effect closeness examination by exploiting the machine's capacity to process information. The model utilized patient's portrayals of indications to remove key data and accomplish early expectation and mediation. Consequently, the precision of likeness examination model to a great extent decides the adequacy of infection expectation. Accurately predicting diseases plays a significant role in public health, especially at the early stage which allows patients to take prevention treatments in time. With the growing volume and availability of electronic health records (EHRs), predictive modeling tasks for disease progression and analysis have obtained increasing interest from researchers.

The EHR data are temporally sequenced by patient visits with each visit represented as a set of high dimensional clinical events. Mining EHRs is especially challenging compared to standard data mining tasks, due to its noisy, irregular and heterogeneous nature. Recently, deep learning and machine learning approaches have been widely adopted and rapidly developed in patient representation learning.

II. LITERATURE SURVEY

Qiuling Suo, Fenglong Ma et al. [1] Stated that presenting a novel time fusion CNN framework to simultaneously learn patient representations and measure pairwise similarity. Compared to a traditional CNN, our time fusion CNN can learn not only the local temporal relationships but also the contributions from each time interval. Along with the similarity learning process, the output information which is the probability distribution is used to rank similar patients.

Prabakaran.N and Kannadasan et al. [2] compares recent healthcare data against data from that particular baseline distribution and hence classifies subgroups of the given data. In addition, the data sample data used is first tested against many types of classifiers and various other proposed test scores have been evaluated.

Peiying zhang, Xingzhe huang et al. [3] proposed a sentence similarity model to carry out symptom similarity

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analysis to achieve elementary disease prediction and early intervention, which makes use of word embedding and convolutional neural network (CNN) to extract a sentence vector that contains keyword information about the patient's feelings and symptoms. In order to increase the accuracy of sentence similarity computation, this model integrated syntactic tree and neural network into the computation process. Our main innovation is to use symptom similarity analysis model for disease prediction and early intervention. In addition, the SPO kernel is also one of the innovations.

Zhaoqian Lan. Guopeng Zhou [4] proposes AI-assisted prediction system, which leverages data mining methods to reveal the relationship between the regular physical examination records and the potential health risk. It can predict examinees' risk of physical status next year based on the physical examination records this year. The system provides a user-friendly interface for examinees and doctors. Examinees can know their potential health risks while doctors can get a set of examinees with potential risk.

Pär Salander et al. [5] proposed that Most spouses witnessed months of global dysfunction preceding the symptom leading to physician consultation. The patient factors 'less alien symptoms', 'personality change' and 'avoidance'; the spouse factors 'spouse's passivity' and 'spouse's successive adaptation'; and the physician factors 'reasonable alternative diagnosis', 'physician's inflexibility' and 'physician's personal values' were identified as obstacles on the pathway to appropriate medical care.

David N. Louis et al. [6] stated that notable changes include the addition of brain invasion as a criterion for atypical meningioma and the introduction of a soft tissue-type grading system for the now combined entity of solitary fibrous tumor / hemangiopericytoma-a departure from the manner by which other CNS tumors are graded. Overall, it is hoped that the 2016 CNS WHO will facilitate clinical, experimental and epidemiological studies that will lead to improvements in the lives of patients with brain tumors.

Pär Salander et al. [7] proposed that Most spouses witnessed months of global dysfunction preceding the symptom leading to physician consultation. The patient factors 'less alien symptoms', 'personality change' and 'avoidance'; the spouse factors 'spouse's passivity' and 'spouse's successive adaptation'; and the physician factors 'reasonable alternative diagnosis', 'physician's inflexibility' and 'physician's personal values' were identified as obstacles on the pathway to appropriate medical care. Et al. [8] stated that the term ''brain tumours'' refers to a mixed group of neoplasms originating from intracranial tissues and the meninges with degrees of malignancy ranging from benign to aggressive. Each type of tumour has its own biology, treatment, and prognosis and each is likely to be caused by different risk factors. Even ''benign'' tumours can be lethal due to their site in the brain, their ability to infiltrate locally, and their propensity to transform to malignancy. This makes the classification of brain tumours a difficult science and creates problems in describing the epidemiology of these conditions.

Jan J Heimans et al. [9] Proposed that a large number of Quality-of-Life instruments have been developed. The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30) and the MOS Short-Form Health Survey are two frequently used general HRQL instruments. A specific brain tumour scale is the Brain Cancer Module, which is designed to be used in combination with general questionnaires. HRQL measurement and neuropsychological examination were used to investigate the impact of radiotherapy and surgery in low-grade glioma patients and the influence of tumour volume, tumour localization, performance status and age in both low-grade and high-grade glioma patients.

Malavika Suresh [10] stated that noncognitive computer user interface, having the endowment to perceive gesture and execute commands based on that. The design is implemented on a Linux system but can be implemented by installing modules for python on a windows system also. OpenCV and KERAS are the platforms used for the identification. Gesture displayed in the screen is recognized by the vision-based

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algorithms. Using background removal technique, an assortment of skin color masks was trained by Lenet architecture in KERAS for the recognition.

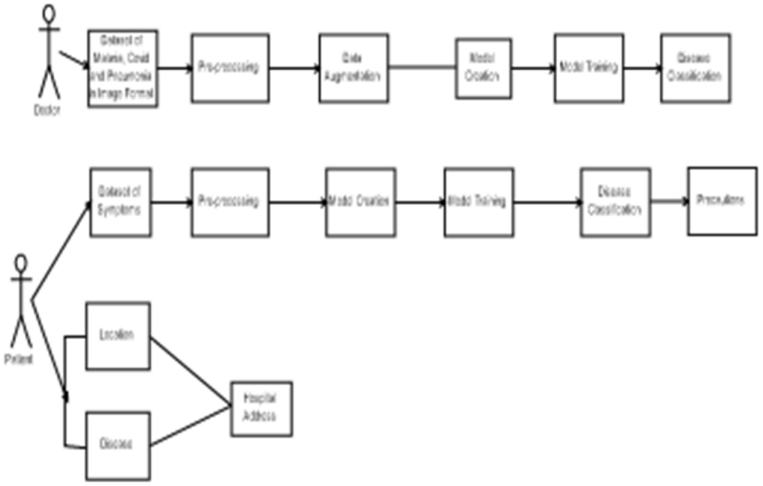
M. Gurbina, M. Lascu, D. Lascu [11] stated that differentiate between normal brain and tumor brain (benign or malign). The study of some types of brain tumors such as metastatic bronchogenic carcinoma tumors, glioblastoma and sarcoma are performed using brain magnetic resonance imaging (MRI). The detection and classification of MRI brain tumors are implemented using different wavelet transforms and support vector machines. Accurate and automated classification of MRI brain images is extremely important for medical analysis and interpretation.

S. Somasundaram, R. Gobinath [12] stated that focuses on six features that are entropy, mean, correlation, contrast, energy and homogeneity. The performance metrics accuracy, sensitivity, and specificity are calculated to show that the proposed method is better compared to existing methods. The proposed technique is used to detect the location and the size of a tumor in the brain through MRI image by using.

III. PROPOSED SYSTEM

Proposed System Architecture:

In a proposed system, we are proposing experiment on diseases like Pneumonia, Covid19, malaria, migraine, heart disease diseases with limited set of supervised data.



1. **Dataset of Disease**: The dataset consists of a greater number of images to train or learn the model.Because the dataset consists images with their classes. Dataset consist pneumonia, lung cancer and brain tumor at least 200-250 images per class.

2. **Pre-processing: The** pre-processing will reshape the size into fixed dimension.

3. **Model Creation:** Selecting the deep learning model to classify the disease. In this proposed method we have choose the Convnet. We propose a new Convolutional neural network based multimodal disease risk prediction model for limited Pneumonia, Covid19, malaria, migraine, heart disease with higher accuracy. We are going to solve accuracy issue in diagnosis of Pneumonia with accurate stage predictions. We also work on malaria detections by machine evaluations depends on sizes in mm. Covid19 detection depends on diagnosed dataset. Admin and users are two modules include in our system. Admin first gather the information about multiple diseases in the form of images.

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After gathering of information like pre-processing on the data, training of the data, model generation according to the features of the data. User insertsthe image for checking Pneumonia, lung cancer and brain tumour diseases. Using our proposed system, we predict the disease according to different type of stages. We are trying to develop system for multi disease detection and stages predictions gives early detection and saves lots of life's by reducing death rate by skin diseases.

We are going to invent system which will help to medical research and diagnosis tool. Our work is based on machine learning techniques for multiple disease detection framework.

Modules:

1. Malaria Detection
2. Covid19 Detection
3. Pneumonia Detection
4. Migraine Detection
5. Heart Disease Detection

Data Flow Diagrams

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modelling its *process* aspects. A DFD is often used as a preliminary step tocreate an overview of the system without going into great detail, which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design).

A DFD shows what kind of information will be input to and output from the system, how the data will advance through the system, and where the data will be stored. It does not show information about process timing or whether processes will operate in sequence or in parallel, unlike a traditional structured flowchart which focuses on control flow, or a UML activity workflow diagram, which presents both control and data, flows as a unified model. In dfd-0 the user enters with the credential and upload the image for prediction.

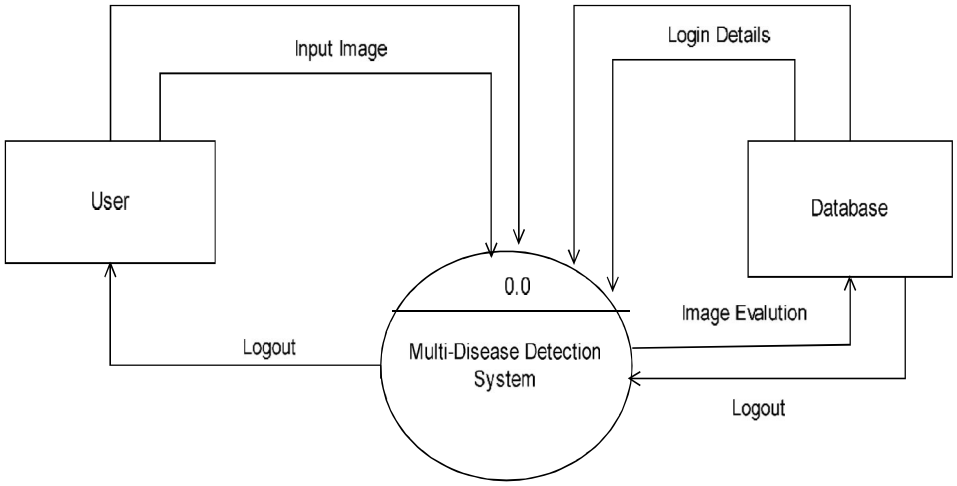

Figure 4.2: DFD level 0

DFD Level 1:

In dfd-1 the user will get the response from the system like disease detection and accordingly those we recommend the precautions.

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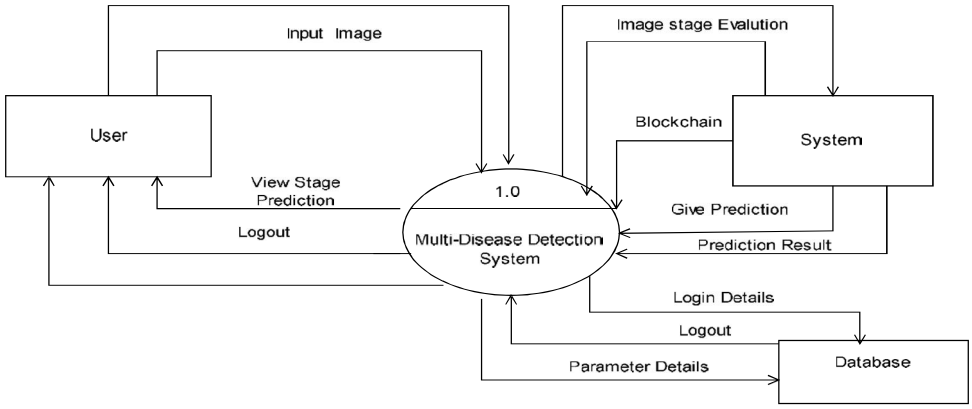


Figure 4.3: DFD 1 level

Entity Relationship Diagrams:

An entity–relationship model (ER model for short) describes interrelated things of interest in a specific domain of knowledge. A basic ER model is composed of entity types (which classify the things of interest) and specifies relationships that can exist between instances of those entity types.

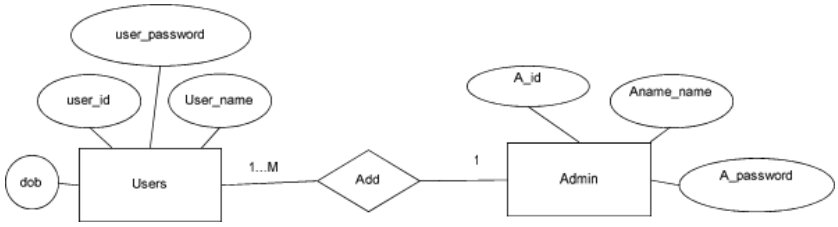
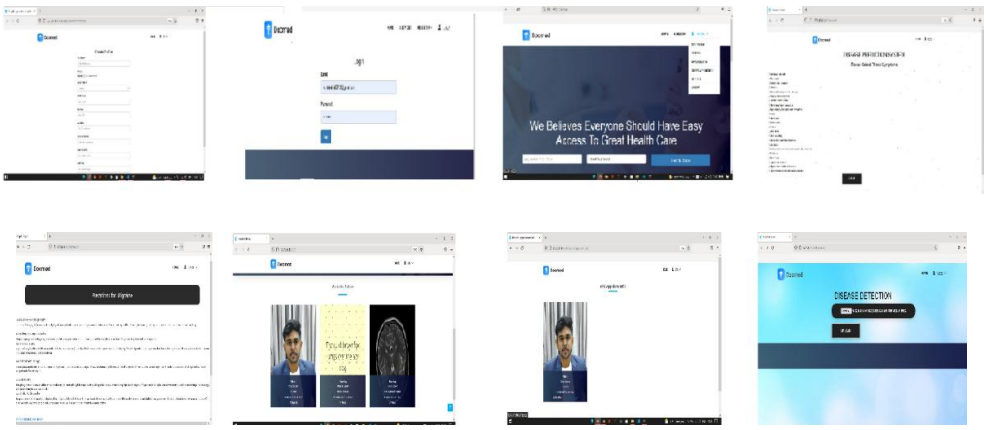


Figure 4.4: ER- Diagram

In software engineering, an ER model is commonly formed to represent things that abusiness needs to remember in order to perform business processes. Consequently, the ER model becomes an abstract data model, that defines a data or information structure which can be implemented in a database, typically a relational database. The data we have taking from the user is user_id, password, mail id all these details will store in the database. Every time user wants to provide their credentials for accessing the services.

IV. RESULT AND DISCUSSION



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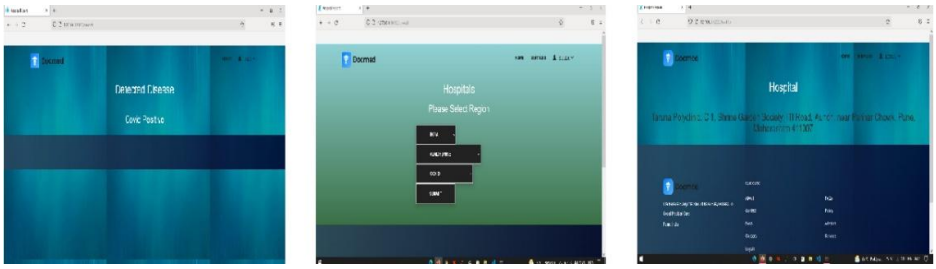

V. CONCLUSION / FUTURE WORK

In the system, we are invented Symptoms based disease prediction is based on Machine Learning and disease prediction by image data using deep learning. This system is useful for both doctors and patient. A patient can predict the disease based on the symptoms and recommend the hospital also and doctors will identify the disease uploading chest x-ray images. Our system takes symptoms and image as input and gives output as disease, possible precautions.

FUTURE WORK

In future work we are going to focus on more detailed study and developed android apps for medical related disease.

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