

## International Journal of Innovative Research in Science, Engineering and Technology

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# Implementation of Disease Prediction in Medical Data Using Data Mining

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**ABSTRACT:** Computers have become a required part of organizational information processing because of the power of technology and volume of data to be processed. Through the technology, the manual process, defects and time expenditure can be reduced. In all the domain of business, computer technology are widely being implemented. Hence the establishment of computers had a great role in reducing large tasks to simpler one. It specially developed for the hospital environment. It contains the template for photos about each stage of cancer for all types of cancer and also other diseases. When the patients show the scan report, the doctor can compare the existing scan information and can analyze what type of the disease and stage of the disease and also display the detail about medicine detail, what time patients will take the medicine, specialist doctor, food details, full description of disease.

**KEYWORDS:** disease, hospital, scan reports, comparison, data mining techniques, image processing

### I. INTRODUCTION

The information from a collection of datasets. Data mining is also called as discovery, data discovery, information harvesting, data pattern analysis, knowledge extraction. There are two common techniques available in data mining such as predictive and descriptive. There are different kind of approaches used in data mining.

#### 1. Predictive

i. Classification

ii. Prediction

iii. Time series analysis

iv. Regression

#### 2. Descriptive

i. Association

ii. Clustering

iii. Summarization

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## II. DATA MINING

Data mining is the process of analyzing the hidden pattern of data according to the different perspectives, which is collected and assembled in common areas such as a data warehouse. It is the process of fetching Now a days Data mining is widely used in medical environment such as storing the scan reports, patient and doctor details, healthcare tips, medicine details etc.

a.)Disease prediction- By using data mining techniques, doctors can analyze the type of disease and stage of disease.Disease details are already stored in the database in the form of data sets. Using clustering techniques, doctors can fetch the particular disease details from the database.

b.)Diagnosis-Medical diagnosis is represented as Dx or Ds.It is the process of examining which disease or condition explains a person's symptoms and signs.Some diagnostic procedures are diagnostic tests, posthumous diagnosis considered a kind of medical diagnosis.

c.)Treatment techniques- Treatment procedures are appropriateness and cost effectiveness.In this, patients are also choosing their own treatment , according to the doctor suggestions.According to the patients conditions, doctors can give medicines, treatments, suggestions.

d.)Medical instrument industry- Today's world, there are huge amount of medical instruments available in medical environment such as Endoscope, gas cylinder, therapeutic gadgets, ventilator, ECG etc.

## III. DATA MINING IN MEDICAL FIELD

In today's world the technology is rapidly increasing and also increasing popularity. Medical data suggested databases that stores social information, patients details, disease details, specialist doctors in their own field.This database includes extension volume of information which contains the expanded details about the patient. Medical informations are fetched from various resources like Computerized

Tomography (CT), Magnetic Resonance Images (MRI), X-Rays, Positron Emission Tomography (PET), Ultra Sound (US).



Fig. 1. Human brain with scan image

## IV. IMAGE PROCESSING

Image processing is a process of performing some operations on the image or to convert an image into digital form.In this process input as image like video, photograph and output as image or characteristics. It was developed in 1960 at Jet Propulsion Laboratory, Massachusetts Institute of Technology, Bell Laboratories, University of Maryland.There are two types of image processing such as Analog Image Processing (AIP) and Digital Image Processing (DIP). Any data that is represented by two ways, such as analog and digital.

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a.) Analog Image Processing-It is defined as any image processing tasks handled on two dimensional analog signals.Eg:TV broadcasting in older days through the antenna. Any image that can be denoted as a collection of pixels. In analog pixels values are in the form of continuous.

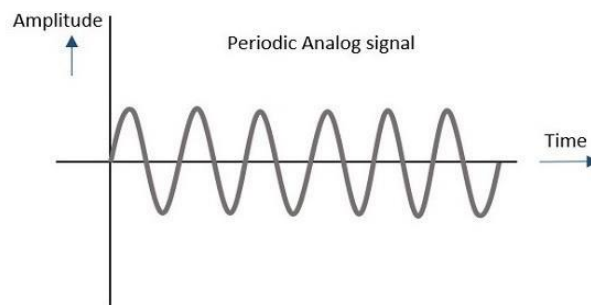


Fig. 2: Analog Signal Wave

b.) Digital Image Processing- It is the process of performing operations on the digital image.In this pixel values are in the form discrete. Eg:Photoshop, multimedia images.

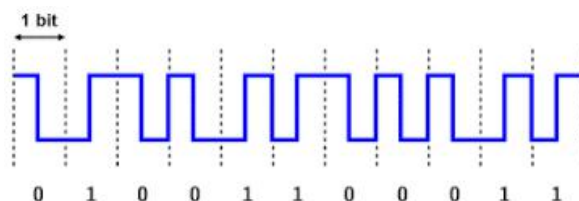


Fig. 3: Digital Signal Wave

### V. IMAGE PROCESSING TECHNIQUES

a.) Convolution- Convolution is the simple mathematical operation which is rooted to many common image processing operators. It provides a way of multiplying together two arrays of numbers, generally of different sizes, but of the same dimensionality to produce a third array of the numbers of the dimensionality. There are two different approaches in convolution such as a Low pass filter and High pass filter.

b.) Edge detection- It is the process of determining the boundaries of objects within images.It is used for image segmentation and data extraction. There are three types of edge detection such as Horizontal edges, Vertical edges, Diagonal edges.

c.) Filters –Filter is a device which is used to remove some unwanted components or features from a signal.It is also used to identify either high frequency or low frequency in images. There are four types of filters used in image processing such as Low pass filter, High pass filter and Notch filter, Band pass filter.

d.) Trend removal- It is the process of identifying and removing the intensity of images by choosing row and column fields.

e.) Image analysis- It is the process of fetching the meaningful information from images mainly from digital images. This operation can be as simple as reading bar coded tags. It can also detect the format of images like GIF, PNG, JPEG, GNF etc.

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f.) Mathematics- It is used to perform a variety of operations like add images, add two images together, pixels by pixels or Subtract images,subtracts second image from the first image, Exponential and logarithmic functions, scalar adds, scalar subtract etc.

## VI. MEDICAL IMAGE PROCESSING

In medical environment there are several image processing available. There are different scanning images using in medical field.

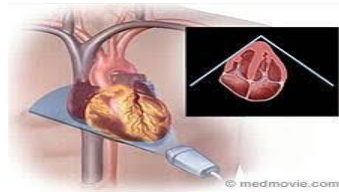


Fig.4 : Ultra Sound scan image

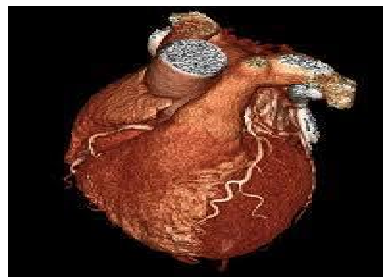


Fig.5: CT scan image



Fig.6 :MRI scan image

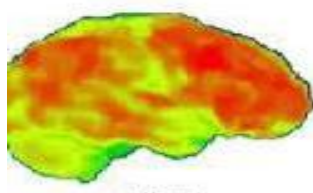


Fig.7: PET scan image

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Fig.8 : X-Ray scan image

## VII. EXISTING SYSTEM

In existing system, for image enhancement the work carried out by various researchers is available. Better result is produced by using Adaptive histogram equalization but the appearance of the image is still not free from washed out form. The contrast and sharpness are poor. The background information and the plane are still obscure. Alpha rooting contribute the whole image in a dark tone. In case of histogram equalization outline of the cloud is visible is lost.

Fuzzy C Means(FCM)- It is an algorithm in which Clustering algorithm was used. Fuzzy clustering is a form of clustering in which each data point can belong to one or more cluster. It is also called as soft clustering on soft K-means algorithm, which was developed by J.C. Dunn in 1973 and it was improved by J.C. Bezdele in 1981. It is similar to K-means algorithm. This algorithm was used in many fields like biology, medicine, psychology and economics.

ADPS-Automated Disease Prediction System is used to predict primary idea about diseases and health conditions of the human body using nails and palms of the patients. By using patients nails and palm scan images doctors can identify which type of disease they have and give suggestions to the patient's.

Data mining- This method using soft computing. In this rough sets are suitable for handling different types of uncertainty in data. By using Data mining techniques, doctors can only fetching data according to the patients.

Bloom filter-It is a space efficient data structure for denoting a set and checking whether an element is exactly not or possibly in this set. There are two main operations are performed on bloom filter such as Element addition and Membership query. It chooses an independent set element and hash functions.

Okamoto-Uchiyama Cryptosystem-It contains three algorithms such as key generation, encryption and decryption. Key generation given the security parameter  $k$ , choose two large primes  $p$  and  $q$ . Each

element have individual bits. Encryption means converting an original message (plain text) into cipher text. Decryption is a process of converting cipher text into plain text. By using these techniques a data can be transformed and fetching a data from a database.

## VIII. MODELS AND GOALS

a.) System model-The system model is compromised of a cloud platform, a number of medical users and a health care providers. Medical users (MU) are denoted as patients or undiagnosed patients. Cloud platform (CP) is responsible for helping the healthcare provider can collect the historical medical data. Healthcare provider (HP) can obtain the training data of the naive Bayesian classifier, which can be used to extract the symptoms set of each disease, including all symptom vectors that may cause patients to suffer from the corresponding disease.

b.) Threat model- It is used to identify historical medical data or predicted disease. If the HP obtains a patient's disease history and disease model training.

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c.) Design goals-Under the design goals, there are two approaches such as privacy preservation, efficiency.

## DRAWBACKS

- It is time consuming
- It leads to error prone results
- It consumes lot of manpower to better results
- It lacks data security
- Retrieval of data takes lot of time
- Reports take time to produce

## IX. PROPOSED SYSTEM

The proposed system is specially developed for hospital environment and disease prediction for patients. It contains the template for photos about each stage of disease for all kinds of disease like cancer prediction, brain tumor, heart disease etc. When the patients will show the scan reports to doctor, they can analyze the reports whether that patient is already taking any treatment for that same disease at an earlier time. If they took treatment means doctors can compare the present scan reports with existing scan reports stored in a database. If two images are exactly matches means, there is no improvement of that disease and can give suggestions to the patients. By using the compare of images, doctors can easily predict the stages of disease as well as further suggestions. The proposed system also displays the detail about medicine, what time patients will take the medicine, specialist doctor and food details to the patients.

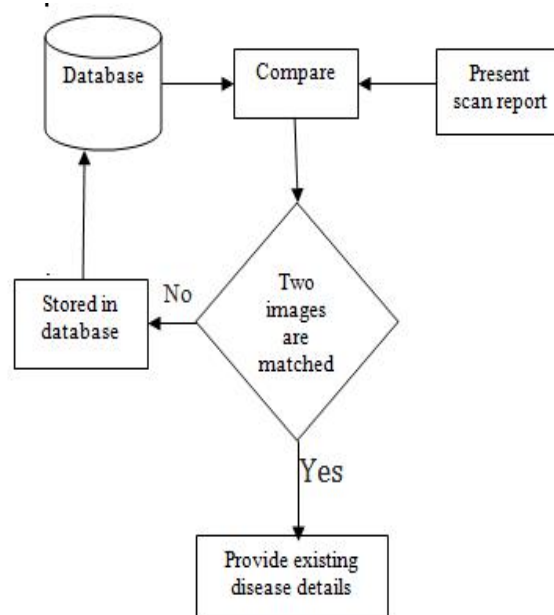


Fig. 9 : Diagram

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## X. CONCLUSION

In existing system patients disease details are stored in a database which can be only viewed by the doctors. In proposing system doctor can analyze the scan reports and then current scan reports are compared with the database. If two images are matched, it will provide full description about diseases like treatment, medicine, what time will patients take medicine, food details.

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