



Project Based Learning  
Presentation On

# “AI-Smart Diagnosis”

By  
Group No. 03

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# Contents

- Project Details
- Motivation
- Problem Statement
- Aim and Objectives of the topic
- Introduction
- Background / Existing system problems
- Methodology
- Conclusion
- References

# Project Details

❑ **Title :** AI-Smart Diagnosis

❑ **Description:**

- ✓ The project aims to develop a model that can accurately detect various diseases by analyzing medical images such as X-rays, MRI scans, and CT scans.
- ✓ The deep learning model will be trained using a large dataset of labeled medical images to identify patterns and features that are indicative of specific diseases.

❑ **Domain:** HealthCare (Deep Learning)

❑ **Scope/Goal :**

- ✓ The goal of this project is to create a highly accurate and efficient tool for medical professionals to use in the diagnosis and treatment of various diseases, leading to improved patient outcomes and quality of care.

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# Motivation

- Developing an AI healthcare project is an incredibly exciting opportunity to make a meaningful impact on people's lives. With this project, you have the chance to leverage the power of artificial intelligence and machine learning to improve patient outcomes, reduce healthcare costs, and ultimately save lives.
- AI technology can provide more accurate diagnoses, faster treatment plans, and more personalized care to patients. By developing an AI healthcare project, you can help address some of the biggest challenges facing the healthcare industry today, such as the shortage of doctors and nurses, the rising cost of care, and the need for more efficient and effective treatments.
- Furthermore, by working on an AI healthcare project, you can contribute to the larger movement of using technology to make the world a better place. This project has the potential to make a lasting impact on the healthcare industry and help improve the lives of countless people.

# Problem statement

- Medical practitioners often face challenges in accurately diagnosing and treating patients due to the complexity of medical conditions and the limited amount of time they have with each patient.
- Traditional methods of healthcare delivery can be time-consuming, costly, and prone to error, leading to poor patient outcomes and high healthcare costs.
- AI can analyze vast amounts of patient data and provide doctors with more accurate and timely diagnoses and treatment options.

# Aim of the Project

- The aim of an AI diagnose app is to leverage the power of artificial intelligence and machine learning to improve the accuracy and speed of medical diagnoses. By analyzing symptoms and medical histories, an AI diagnose app can provide patients with accurate and personalized diagnoses in a matter of minutes, without the need for lengthy doctor visits or potentially costly medical tests.
- The ultimate goal of an AI diagnose app is to improve patient outcomes by providing faster and more accurate diagnoses, which can lead to earlier treatment and better overall health outcomes. Additionally, by enabling patients to take a more proactive role in their healthcare, an AI diagnose app can help improve patient engagement and satisfaction.
- An AI diagnose app can also help address some of the biggest challenges facing the healthcare industry today, such as the shortage of doctors and nurses, the rising cost of care, and the need for more efficient and effective treatments. By leveraging the power of AI technology, an AI diagnose app can help improve the overall efficiency of the healthcare system and reduce costs for patients and providers alike.

# Objectives of the Project

1. Develop accurate and reliable algorithms: The app should be designed with algorithms that can accurately analyze patient symptoms and medical histories, and provide reliable and personalized diagnoses.
2. Train the app's machine learning models: The app's algorithms should be trained using a large and diverse dataset of medical records, including both historical and current patient data, to ensure that the app can provide accurate diagnoses across a wide range of conditions.
3. Design a user-friendly interface: The app should be designed with a user-friendly interface that is accessible to patients of all ages, backgrounds, and levels of health literacy.
4. Ensure effective integration into healthcare workflows: The app should be designed to integrate effectively into existing healthcare systems and workflows, and to support healthcare providers in making accurate diagnoses and treatment decisions.

# Introduction

- Introducing the revolutionary new way to get medical diagnoses: an AI diagnose app that leverages the power of artificial intelligence and machine learning to provide faster and more accurate diagnoses.
- Say goodbye to lengthy doctor visits and costly medical tests with our AI diagnose app, which can provide personalized diagnoses in a matter of minutes.
- Our AI diagnose app is designed to provide patients with a more proactive and personalized approach to healthcare, empowering them to take a more active role in their own health and wellness.
- By analyzing patient symptoms and medical histories, our AI diagnose app can identify patterns and provide accurate diagnoses across a wide range of conditions, helping to improve patient outcomes and reduce healthcare costs.



# Background / Existing System Problems

- **Lack of labeled data:** One of the most significant challenges in training AI models for disease detection is the lack of labeled data. In many cases, researchers have access to only a small amount of data, making it challenging to train accurate models.
- **Bias in data:** The data used to train AI models may not be representative of the population as a whole, leading to biased results. This can be particularly problematic in disease detection, where certain populations may be underrepresented in the data.
- **Overfitting:** Deep learning models can be prone to overfitting, which occurs when the model becomes too specialized to the training data and performs poorly on new, unseen data.
- **Generalization:** AI models trained on one type of disease may not generalize well to other diseases, making it difficult to create a general-purpose disease detection system.

# Methodology

Methodology adopted for Disease Detection using Deep Learning and CNN Architecture.

1. **Data Collection:** The first step in developing a CNN model for disease detection is to collect data. This may involve collecting medical images of the disease from hospitals, clinics, or research centers.
2. **Data Preprocessing:** Once the data is collected, it needs to be preprocessed before training the CNN model. This involves tasks such as resizing the images, normalizing the pixel values, and creating training and validation sets.
3. **Model Architecture:** The next step is to design the CNN model architecture. This involves deciding on the number and type of layers in the model, including convolutional, pooling, and fully connected layers. The architecture of the model depends on the specific disease being detected and the characteristics of the medical images.

# Methodology

4. **Model Training:** The CNN model is trained on the preprocessed data using backpropagation to optimize the model parameters. The goal is to minimize the difference between the predicted outputs and the actual outputs of the model.
5. **Model Evaluation:** After the model is trained, it is evaluated on a separate test dataset to assess its performance. This involves computing metrics such as accuracy, precision, recall, and F1 score.
6. **Fine-tuning:** In some cases, the model may not perform well on the test dataset, so it needs to be fine-tuned. This involves adjusting the model parameters or architecture to improve its performance.
7. **Deployment:** Once the model is trained and evaluated, it can be deployed in a real-world setting. This may involve integrating the model into an existing healthcare system or developing a new application for disease detection.

# Model Metrics

## ☐ Kidney Model

- Accuracy: 98.88%
- Recall: 98.89%
- F1 score: 98.69%
- Precision: 98.46%

## ☐ Lungs Model

- Accuracy: 75.93%
- Recall: 71.20%
- F1 score: 75.35%
- Precision: 82.99%

## ☐ Brain Model

- Accuracy: 94.88%
- Recall: 94.75%
- F1 score: 94.72%
- Precision: 94.72%

# Model Metrics

## ❑ Tuberculosis Model

- Accuracy: 85.07%
- Recall: 85.46%
- F1 score: 85%
- Precision: 85.89%

## ❑ Random Model

- Accuracy: 94.41%
- Recall: 95.11%
- F1 score: 93%
- Precision: 93.6%

# Report Details

## ❑ Brain Tumor

### ❖ Symptoms:

- 1.Headaches
- 2.Cognitive or neurological changes
- 3.Behavioral or mood changes
- 4.Nausea and vomiting
- 5.fatigue and weakness

### ❖ General Prescription:

- 1.Surgery
- 2.Radiation therapy
- 3.Chemotherapy
- 4.Targeted therapy
- 5.Corticosteroids

# Report Details

## ❖ **Precautions:**

- 1.Regular check-ups
- 2.Practice healthy lifestyle habits
- 3.Avoid exposure to harmful substances
- 4.Follow prescribed treatment plan
- 5.Seek medical attention for concerning symptoms

## ❑ **Tuberculosis (TB)**

## ❖ **Symptoms:**

- 1.Persistent cough
- 2.Chest pain
- 3.Fatigue
- 4.Weight loss
- 5.Fever and chills
- 6.Breathlessness

# Report Details

## ❖ **General Prescription:**

Some commonly used medications for TB include:-

- 1.Isoniazid
- 2.Rifampin
- 3.Pyrazinamide
- 4.Ethambutol
- 5.Streptomycin

## ❖ **Precautions:**

- 1.Take medications as prescribed
- 2.Follow infection control measures
- 3.Avoid close contact with others
- 4.Practice good hygiene
- 5.Stay informed 6.Get screened



# Report Details

## ❑ **Kidney Disease**

### ❖ **Symptoms:**

- 1.Fatigue and weakness
- 2.Swelling of feet and ankles
- 3.High blood pressure
- 4.Nausea and vomiting
- 5.Changes in urine frequency, color and in some cases blood in urine
- 6.Muscle cramps or twitches

### ❖ **General Prescription:**

- 1.Medications to control high blood pressure
- 2.Fluid management
- 3.Dietary and lifestyle changes
- 4.Dialysis
- 5.Kidney transplant

# Report Details

## ❖ **Precautions:**

1. Monitoring blood pressure
2. Managing blood sugar level
3. Avoiding nephrotoxic substances
4. Hygiene and infection prevention
5. Following a renal-friendly diet

## ☐ **Lung Disease**

## ❖ **Symptoms:**

1. Persistent cough
2. Shortness of breath
3. Fatigue and chest pain
4. Respiratory infections
5. Changes in sputum or coughing up blood
6. chest tightness or discomfort
7. changes in voice

# Report Details

## ❖ **General Prescription:**

1. Medications to manage symptoms
2. Oxygen therapy
3. Pulmonary rehabilitation
4. Immunizations
5. Targeted therapies

## ❖ **Precautions:**

1. Avoiding smoking and exposure to smoke
2. Reducing exposure to air pollutants
3. following prescribed treatment plans
4. Monitoring symptoms
5. Avoiding respiratory infections

# Conclusion

- An AI diagnose app can revolutionize the healthcare industry by providing faster and more accurate medical diagnoses.
- By leveraging the power of machine learning algorithms, an AI diagnose app can analyze patient symptoms and medical histories to identify patterns and provide personalized diagnoses.
- An AI diagnose app can empower patients to take a more proactive approach to their health and wellness, by providing them with the information they need to make informed decisions.
- With robust data privacy and security measures, a user-friendly interface, and seamless integration into existing healthcare workflows, an AI diagnose app has the potential to improve patient outcomes and reduce healthcare costs.

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# Question & Answer