

Kruthica T

Naan Mudhalvan Final Project



PROJECT TITLE

**Automate COVID-19 detection from chest
X-rays using a custom CNN model**

AGENDA

- Project Title
- Project Overview
- Who are the end users
- Solution's value proposition
- Wow in the solution
- Modelling
- Result



PROBLEM STATEMENT

"Developing an automated COVID-19 detection system utilizing Convolutional Neural Network (CNN) models to aid in the timely and accurate diagnosis of the virus.

This project aims to leverage advanced image processing techniques and deep learning algorithms to analyze medical imaging data such as X-rays and CT scans, providing healthcare professionals with a reliable tool for early detection and efficient management of COVID-19 cases. The system seeks to enhance the speed and accuracy of diagnosis, contributing significantly to the global efforts in combating the pandemic."



PROJECT OVERVIEW

Objective: Develop a Convolutional Neural Network (CNN) model using Keras for automated COVID-19 detection from medical imaging data.

Model Architecture: The CNN comprises convolutional, pooling, and dense layers, designed to learn complex patterns from X-ray and CT scan images.

Training Process: The model is trained using a dataset containing images of both COVID-19 positive and negative cases. Image data generators are employed for efficient processing.

Evaluation: After training, the model's performance is evaluated using test data to assess its accuracy in predicting COVID-19 infections.



WHO ARE THE END USERS?

- **Medical Professionals and Radiologist**
- **Healthcare Institutions and Hospitals**
- **Public Health Authorities and Government Agencies**

VALUE PROPOSITION OF MY SOLUTION:

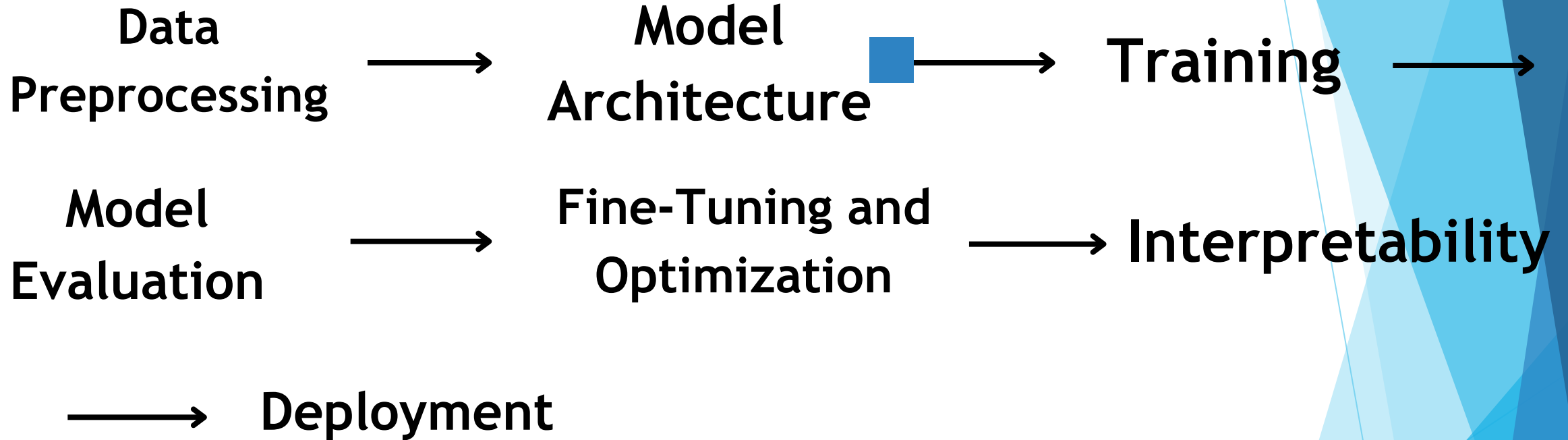
1. **Resource Efficiency:** Streamlined workflows in healthcare institutions, leading to optimized resource allocation.
2. **Scalability:** Scalable deployment across hospitals and clinics, impacting a broader population.
3. **Ethical AI:** Addressing biases and ensuring fairness in diagnosis, promoting ethical practices.

THE WOW IN YOUR SOLUTION

“Our solution directly addresses real-world healthcare needs, significantly improving patient outcomes. By automating COVID-19 detection using our custom CNN model, we empower medical professionals with faster and more accurate diagnoses, ultimately saving lives.”



MODELLING



RESULTS

Here the model is evaluated with a Xray iamge and it classifies it as 'Normal'.

```
Epoch 1/5  
40/40 [=====] - 6s 120ms/step - loss: 0.0611 - accuracy: 0.3145 - val_loss: -2.5008 - val_accuracy: 0.5312  
Epoch 2/5  
40/40 [=====] - 5s 116ms/step - loss: -10.7213 - accuracy: 0.3899 - val_loss: -42.9047 - val_accuracy: 0.6250  
Epoch 3/5  
40/40 [=====] - 5s 115ms/step - loss: -344.4258 - accuracy: 0.3962 - val_loss: -165.0288 - val_accuracy: 0.3125  
Epoch 4/5  
40/40 [=====] - 5s 113ms/step - loss: -624.0375 - accuracy: 0.3875 - val_loss: -1899.5437 - val_accuracy: 0.3125  
Epoch 5/5  
40/40 [=====] - 5s 120ms/step - loss: -2412.5972 - accuracy: 0.4403 - val_loss: -3234.0591 - val_accuracy: 0.5312  
1/1 [=====] - 0s 76ms/step  
Normal
```

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