

Pneumonia diagnosis system

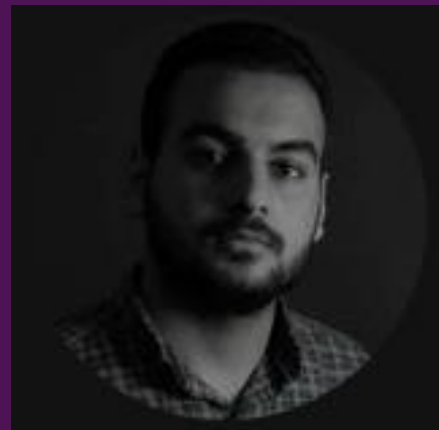
Under Supervision of **Dr. Ibrahim Zaghloul**



Project Team



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(CNN) models

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overview of project

Project
motives

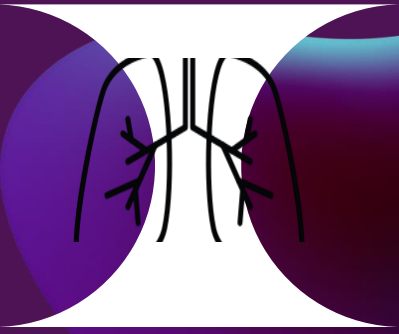
project
idea

Solutions
already in
the field
and what
we will add

System
software
diagrams

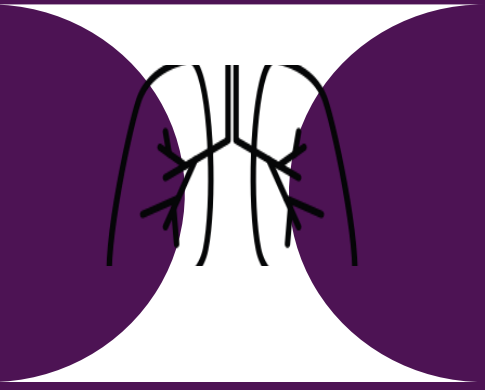
open
source
used
libraries
and
frameworks

PROJECT MOTIVES



- Pneumonia is a leading cause of death in children and the elderly people around the world.
- Chest X-rays are the most thorough method of detecting pneumonia because:
 - It's the cheapest way.
 - No direct contact with the medical staff.
- Due to an erroneous diagnosis and treatment, a person died because of the inconvenient method of diagnosing pneumonia.
- It is now possible to construct an autonomous system for identifying pneumonia and treating the condition, especially if the patient is in a distant area with few medical services

PROJECT IDEA

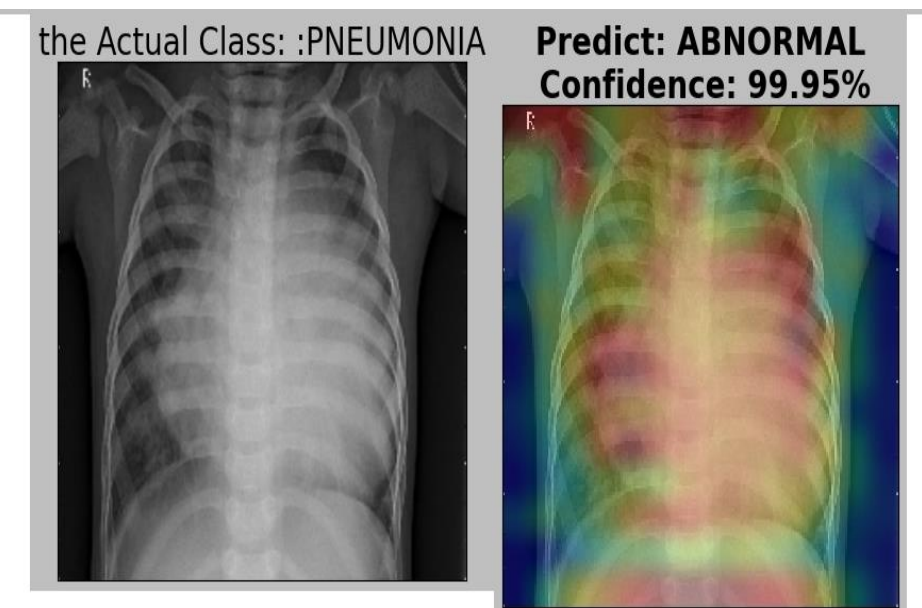
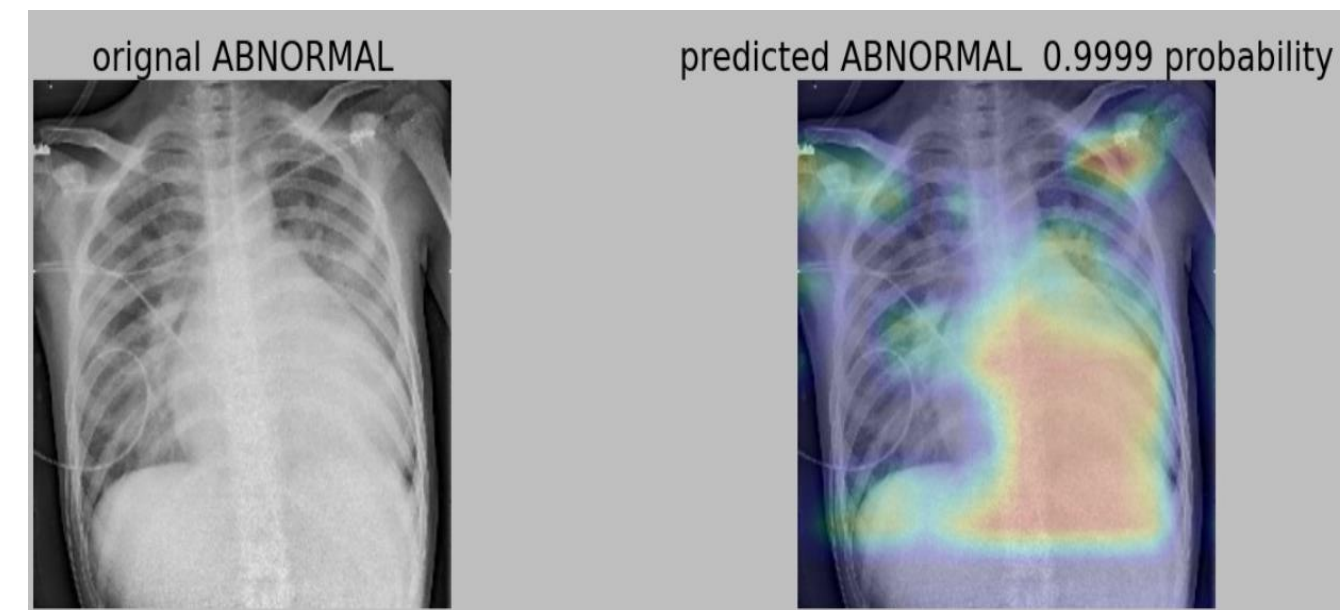


- We will be using Deep Learning Algorithms to detect Pneumonia cases (Normal, Pneumonia, Covid-19) in this project. There are different methods to diagnose Pneumonia using Chest X-Ray images, but we'll examine different algorithms, test overall accuracy, and select the best algorithm for detecting Pneumonia.
- We'll use Flask and HTML to create a Web app to view the results after choosing the best algorithm from the pre-trained ones.



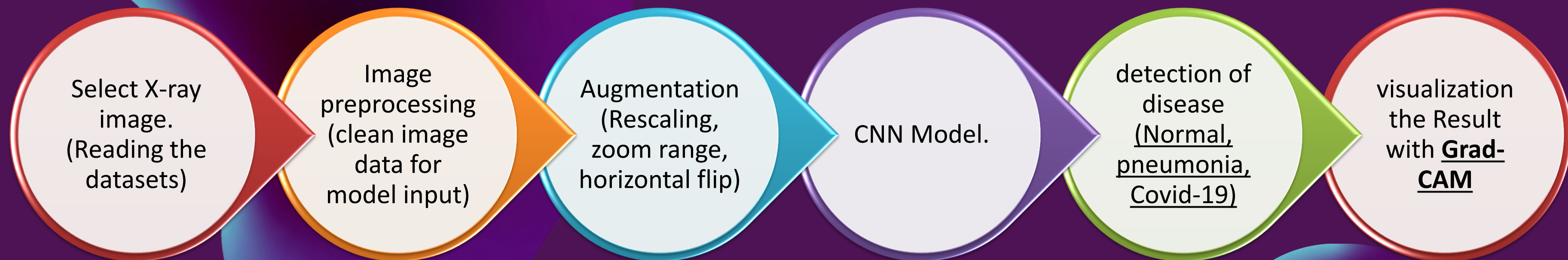
Solutions already in the field of pneumonia detection

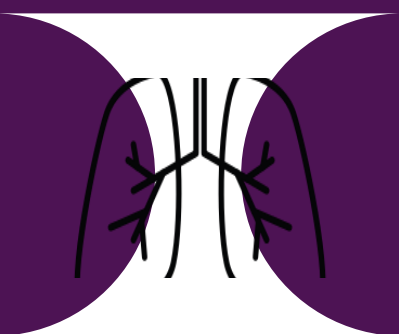
- Pneumonia doctors can detect this case if it is (**NORMAL or ABNORMAL**) but cannot detect ABNORMAL cases which it suffering from.
- The ABNORMAL case would be **pneumonia or covid-19** but the doctor cannot know this difference





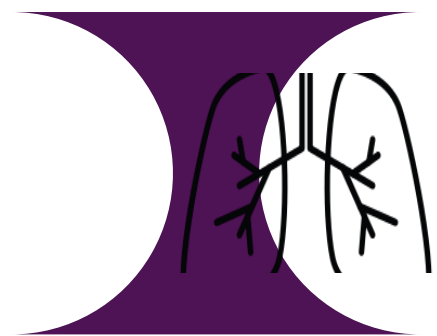
BLOCK DIAGRAM OF THE SYSTEM





open source used libraries and frameworks

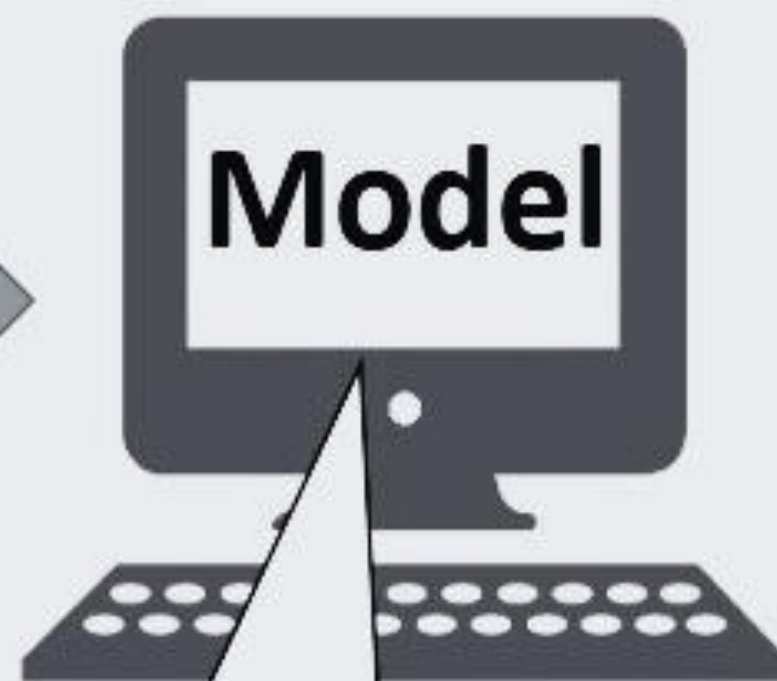




2) Dataset that used



Data



Learn a Task

Don't tell me if-then rules,
Just give me the data and I
will learn the task

About Dataset from Kaggle



Chest X-ray (Covid-19 & Pneumonia)

Dataset contains chest x-ray images of Covid-19, Pneumonia and normal patients.



PNEUMONIA X-ray



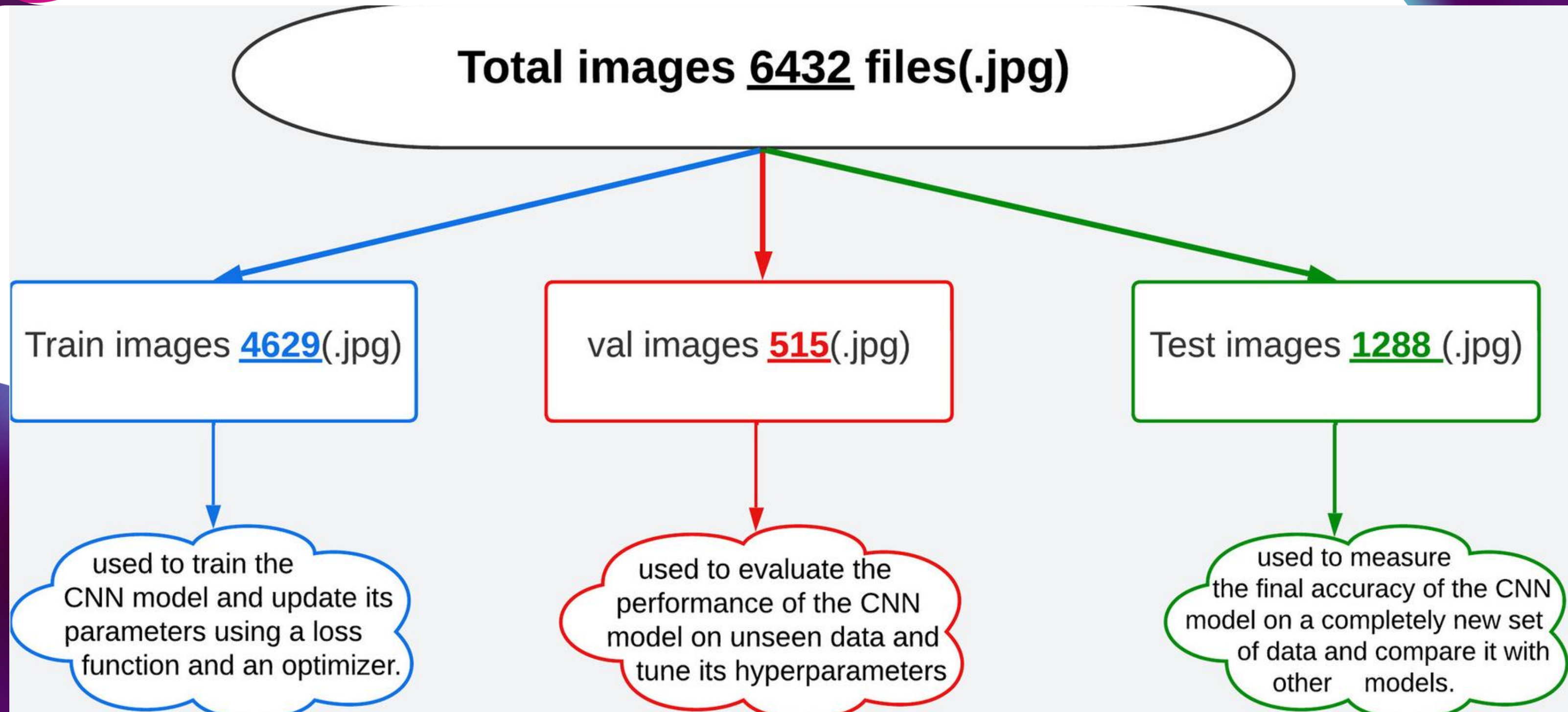
NORMAL X-ray

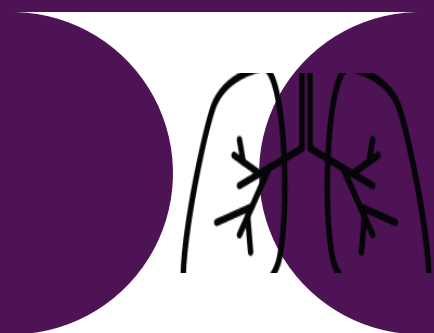


COVID19 X-ray

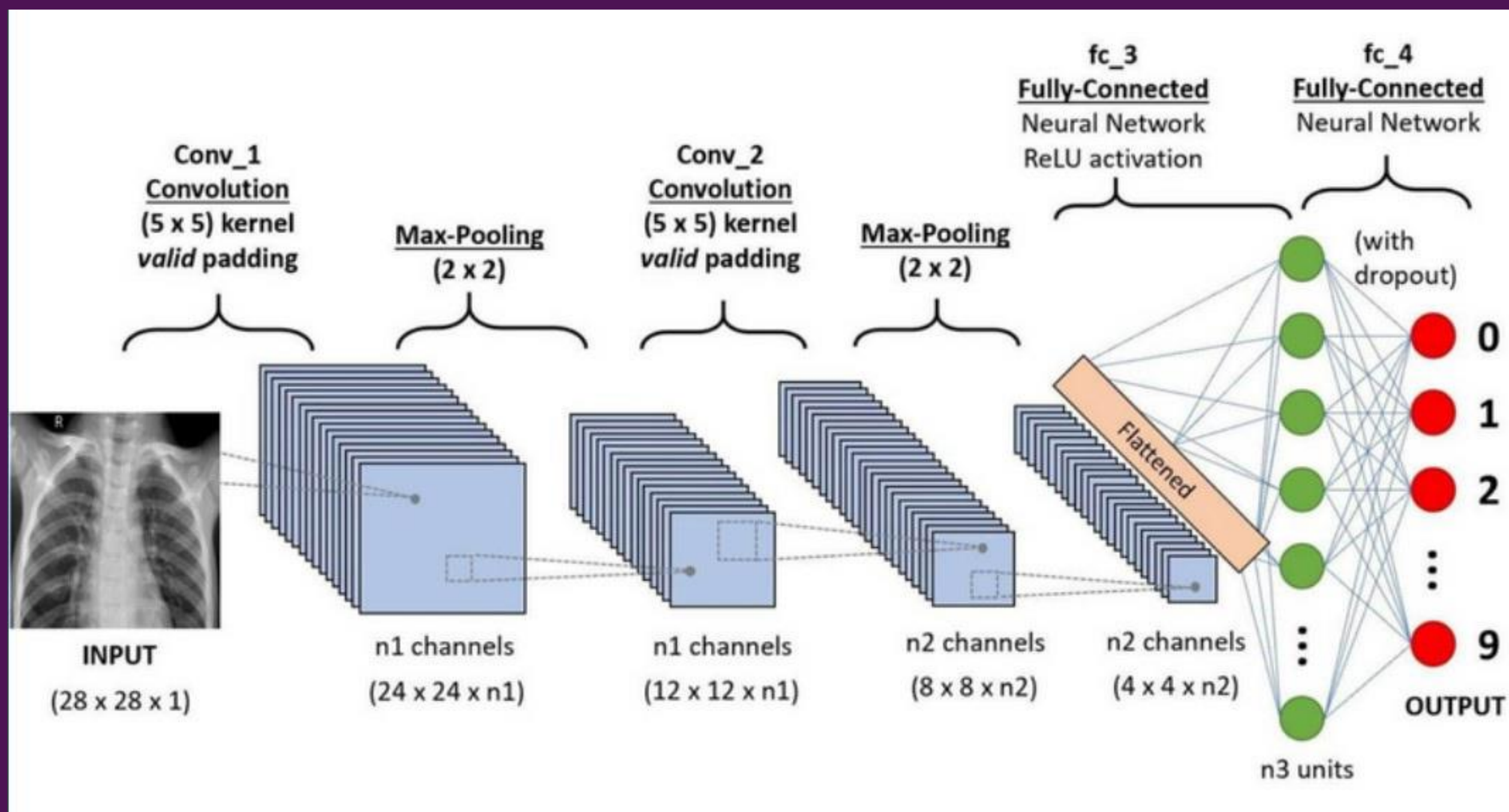


Splitting the dataset



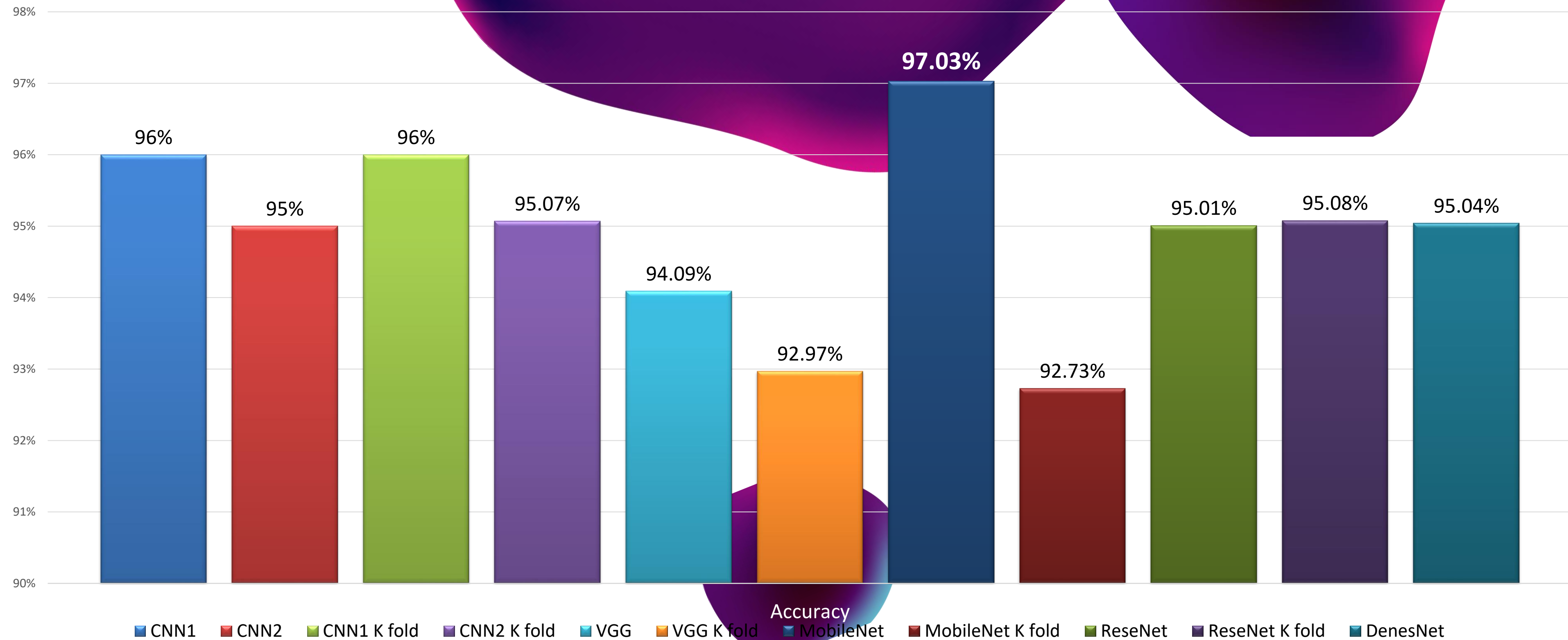


3) Deep learning (CNN) models





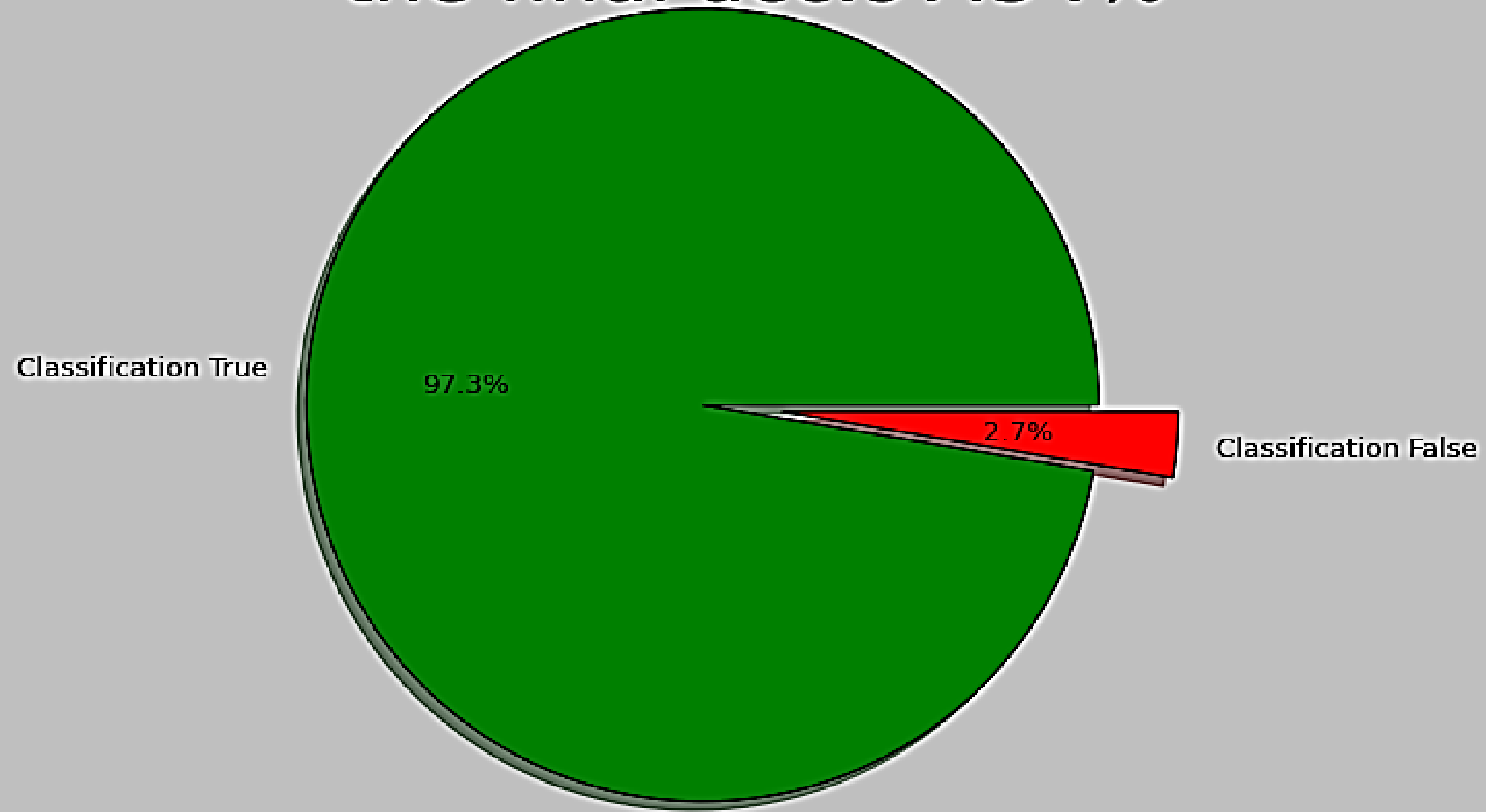
Accuracy of All models

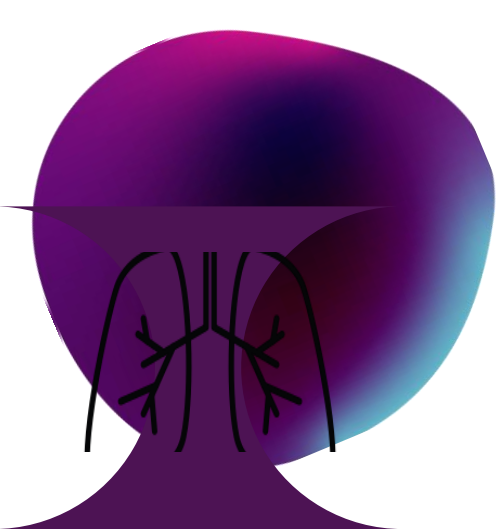




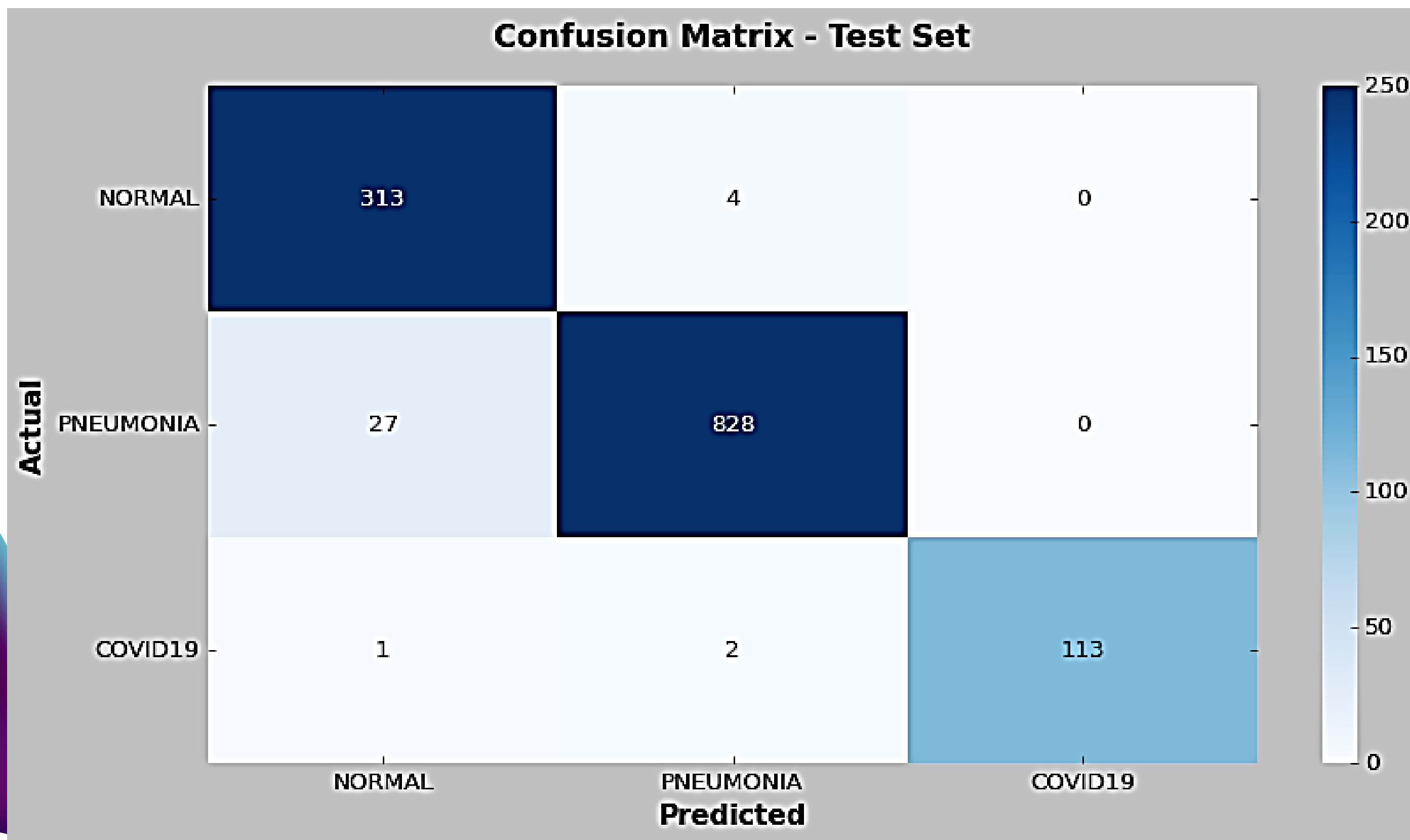
Accuracy score for the best model

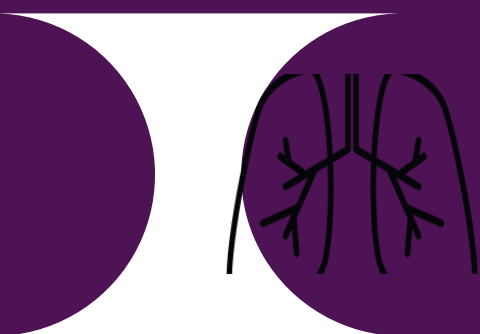
Classification Accuracy
the final acc:97.34%





Confusion Matrix for the test dataset



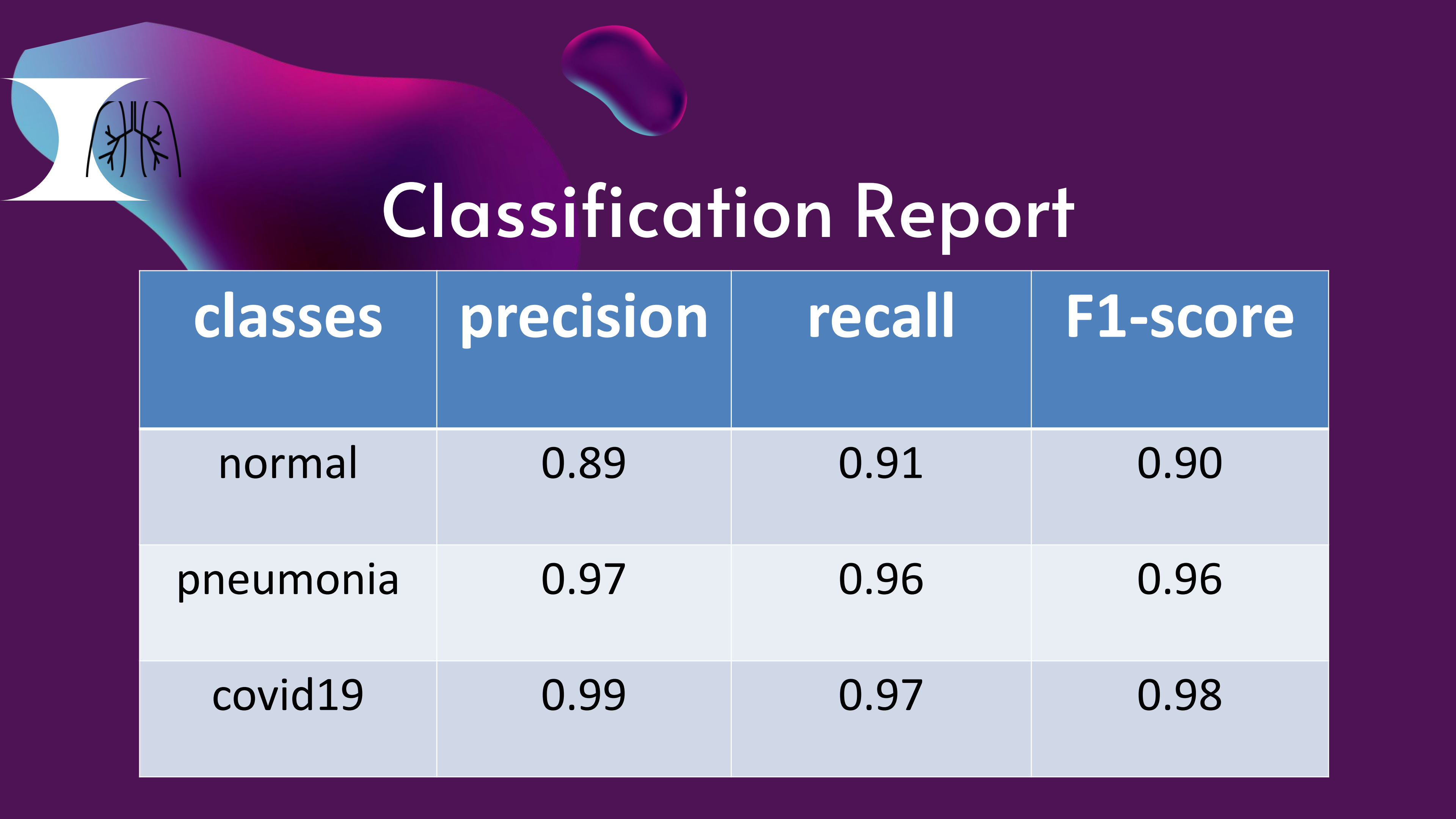


From Confusion Matrix
total 1288 test images

1254 correct matches

34 wrong matches





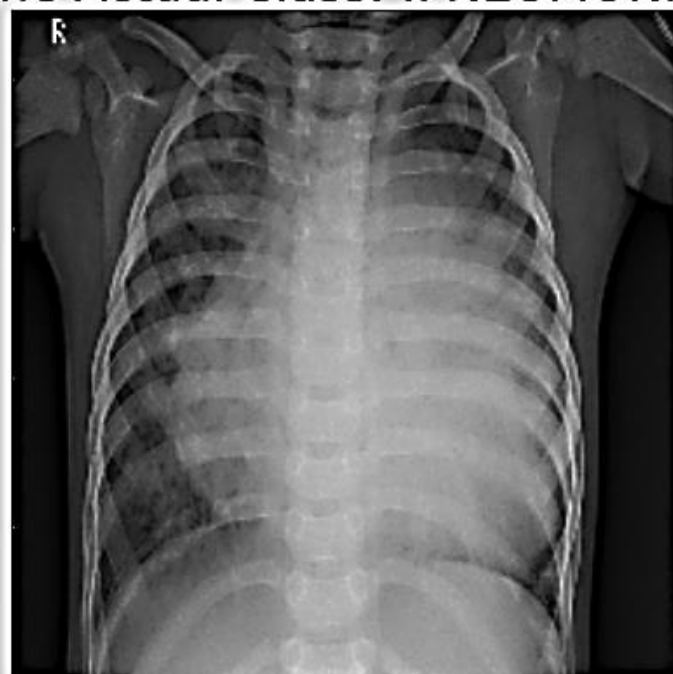
Classification Report

classes	precision	recall	F1-score
normal	0.89	0.91	0.90
pneumonia	0.97	0.96	0.96
covid19	0.99	0.97	0.98

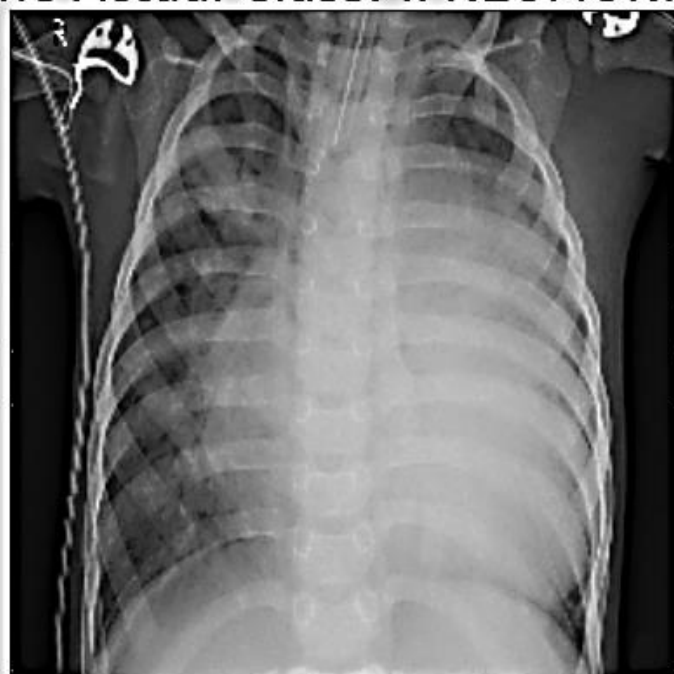


very good Prediction of results

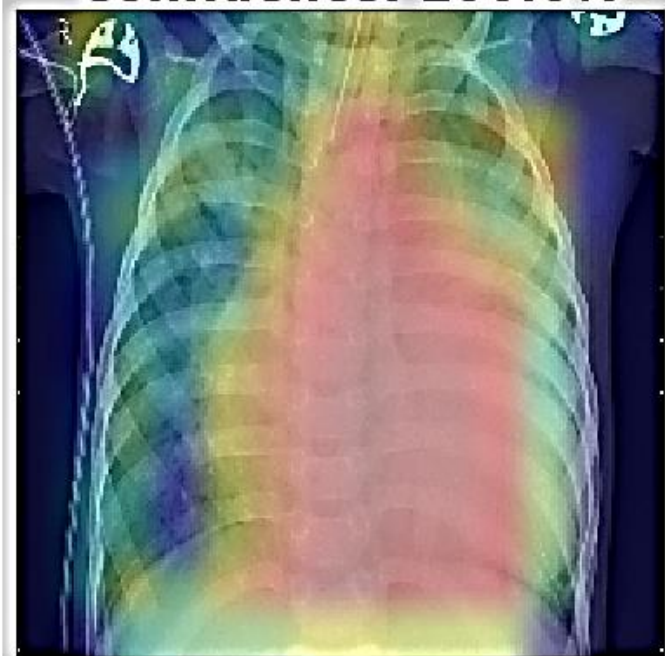
the Actual Class: :PNEUMONIA the Actual Class: :PNEUMONIA the Actual Class: :COVID19 the Actual Class: :NORMAL



Predict: PNEUMONIA
Confidence: 100.0%



Predict: PNEUMONIA
Confidence: 100.0%

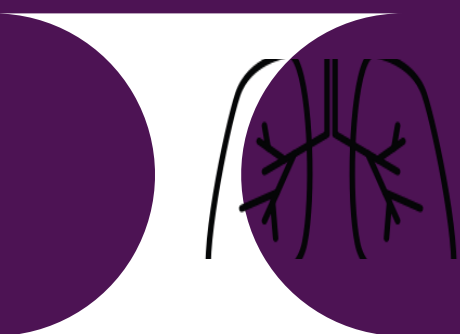


Predict: COVID19
Confidence: 99.92%

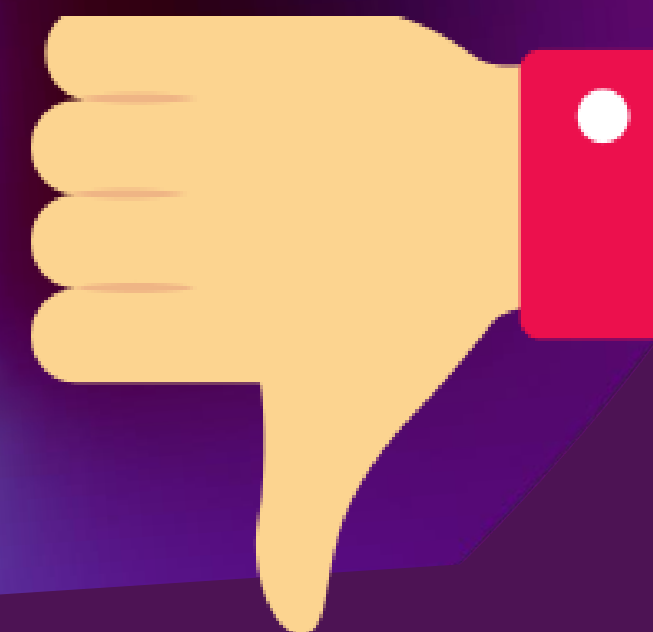
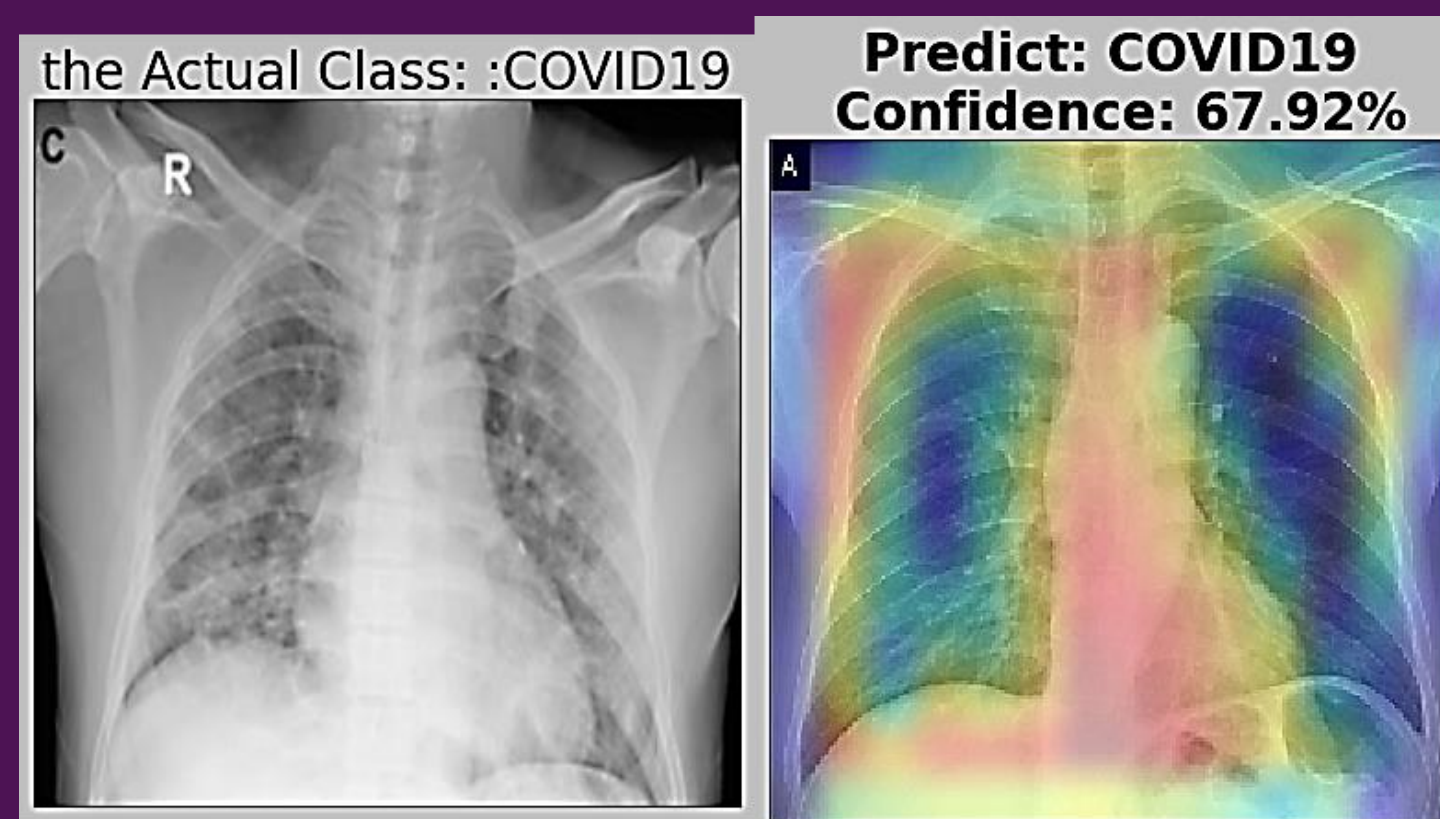
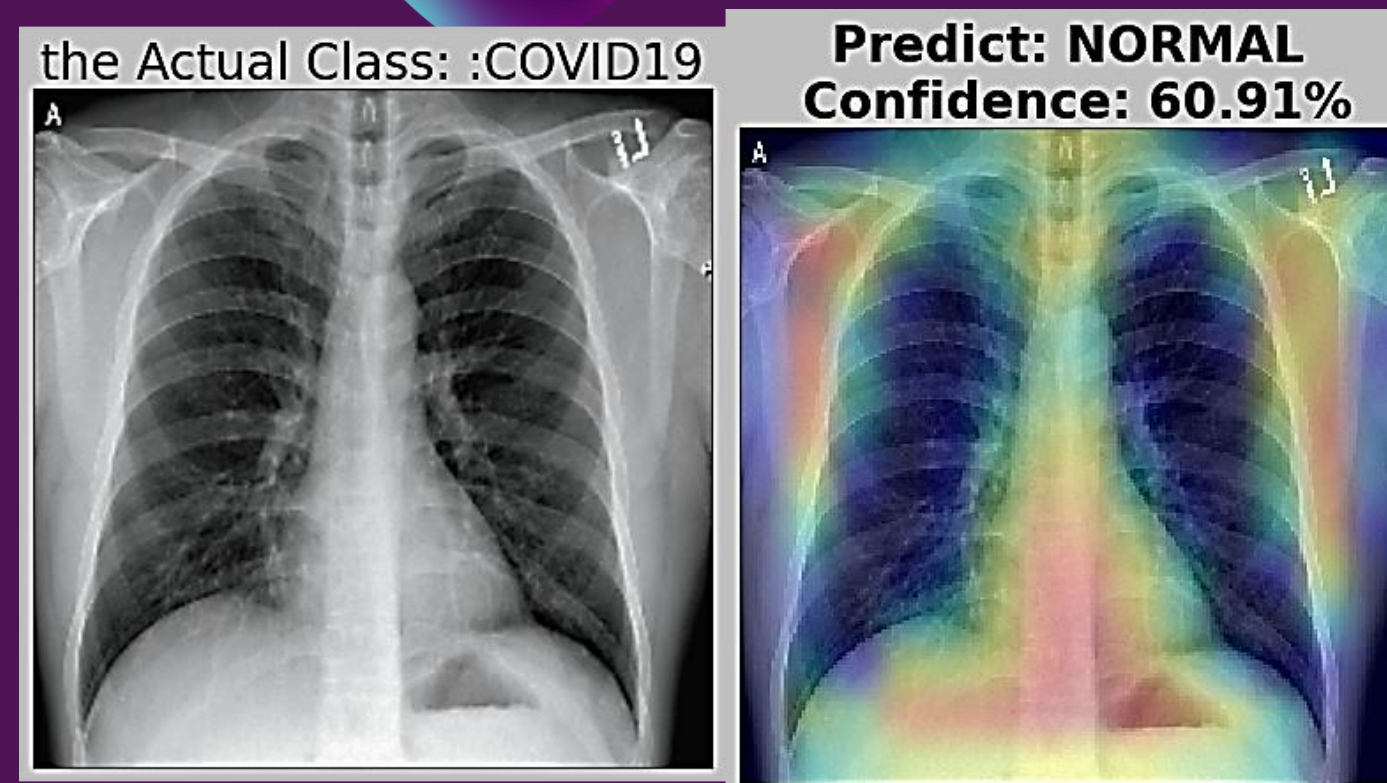


Predict: NORMAL
Confidence: 99.92%

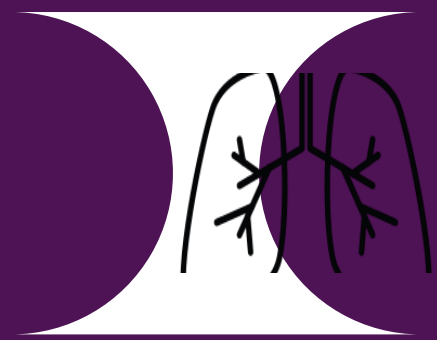




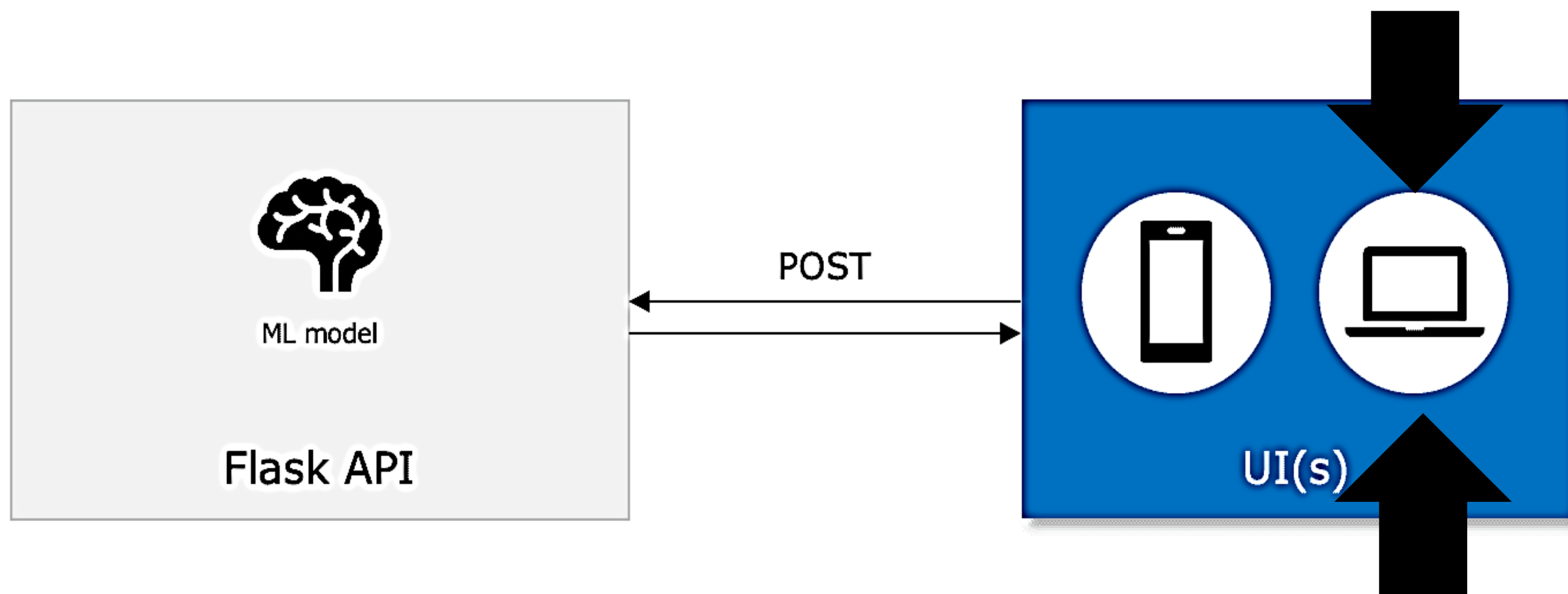
Bad Prediction of results



NOT
BAD



4) API using flask





5) website design

The title of our site is
(Pneumonia System)
the site is divided into eight pages

each page has a specific function or
purpose, and each page will be
presenting and how to deal with it
without errors.




1- The Home page

The Home page in our system consists of a header that contains a button to access the registration and login page in the system and also many small articles that talk in detail about the entire project and the general idea that the project deals with and also contains a part containing contact information with the administrators of the system.

Examination types

Cases that the system can handle


PNEUMONIA X-ray



Pneumonia

Pneumonia is a leading cause of death in children and the elderly around the world. We will be using Deep Learning Algorithms to detect Pneumonia.


NORMAL X-ray



Normal


We will be using Deep Learning Algorithms to detect Pneumonia Normal Case in this project. There are different methods to diagnose Pneumonia using Chest X-Ray images, but we'll examine different algorithms, test overall accuracy, and select the best algorithm for detecting Pneumonia..

COVID19 X-ray



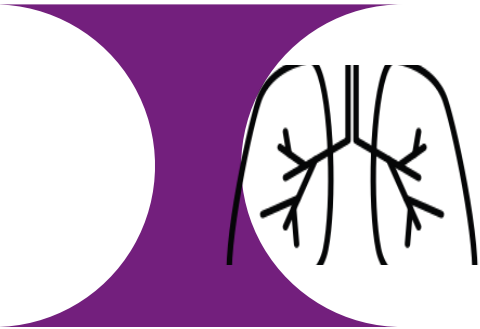
Covid-19

COVID-19 (coronavirus disease 2019) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), a strain of coronavirus. The first cases were seen in Wuhan, China, in late December 2019 before spreading globally. The current outbreak was officially recognized as a pandemic by the World Health Organization (WHO) on 11 March 2020.

Login

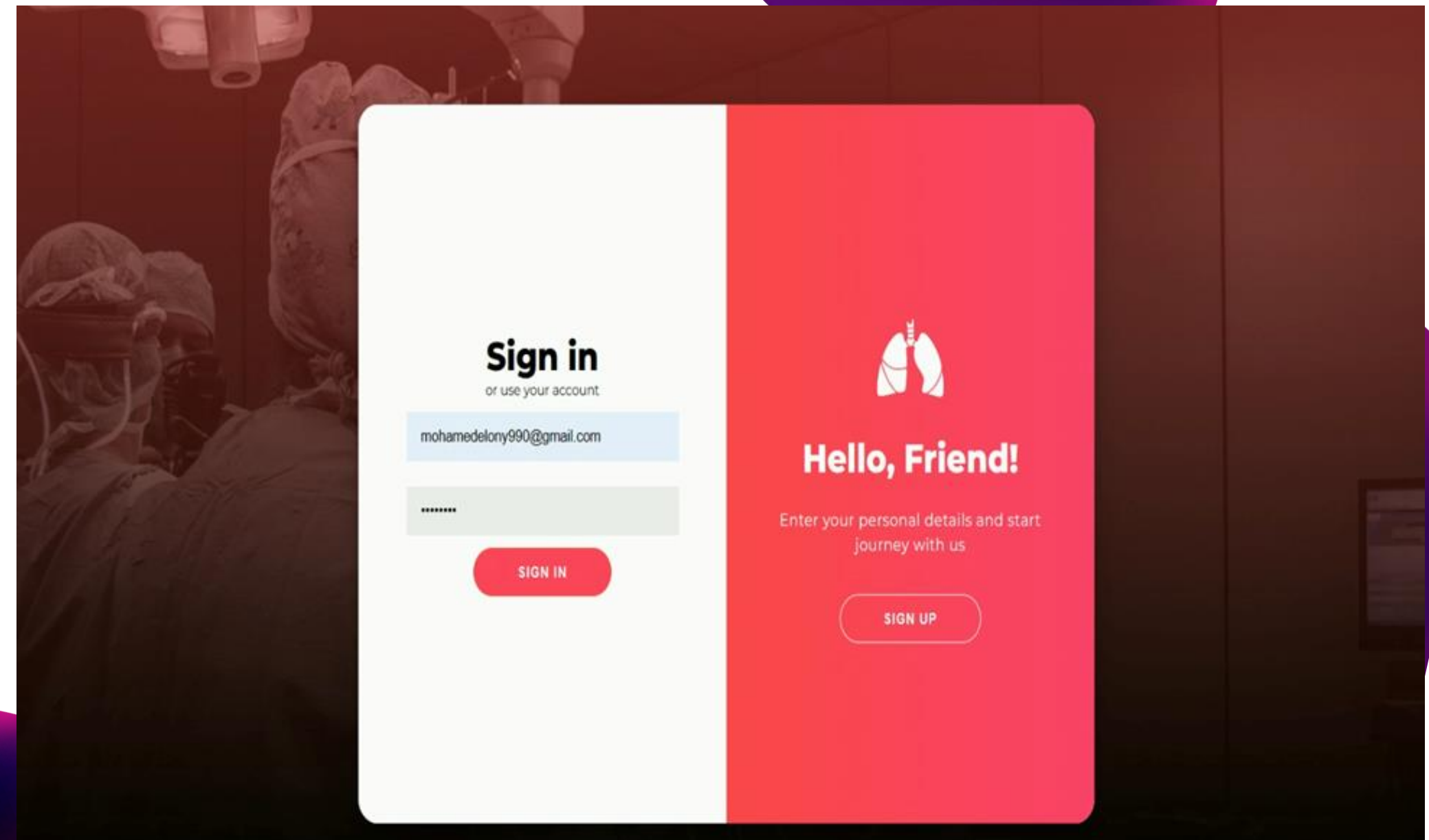
Hello There

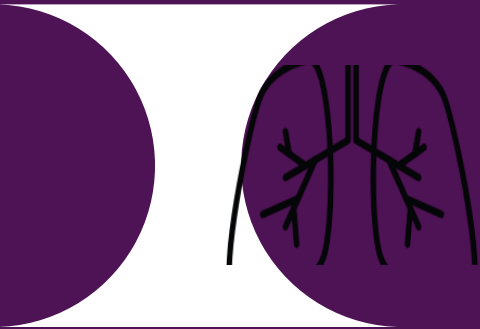
We are Pneumonia System



2- sign in

The page consists of two parts, the part on the left contains two fields, one for writing the email and the second for writing the password, and then you press the Sign In button. As for the part on the right, it contains the Sign Up button, to be directed to the Sign Up page.





3- Sign Up Page

On this page, you can create a new email to start accessing the special services

A screenshot of a web application's sign-up page. The background is a dark, reddish-brown image of medical professionals in an operating room. Overlaid on this is a white and orange form. The form is divided into two main sections. The left section has an orange background and contains a white lung icon, the text 'Welcome Back!', a subtext 'To keep connected with us please login with your personal info', and a 'SIGN IN' button. The right section has a white background and is titled 'Create Account' with the subtext 'or use your email for registration'. It contains five input fields: 'Full Name', 'Email', 'Address', 'Password', and 'Confirm Password'. At the bottom of this section is a 'sign up' button.

Welcome Back!
To keep connected with us please login with your personal info
[SIGN IN](#)

Create Account
or use your email for registration

Full Name

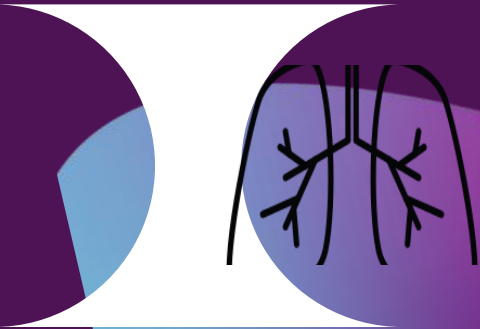
Email

Address

Password

Confirm Password

[sign up](#)



4- *Update Profile Page*

On this page, you can edit your email information.

BACK

Update Profile

Full Name

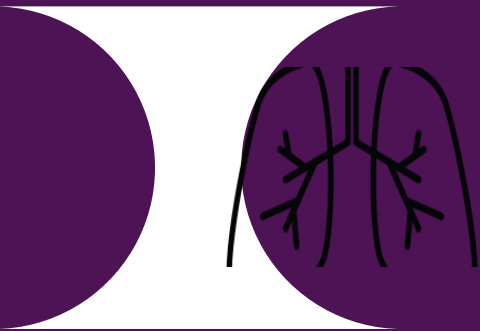
Email

Address

Password

Confirm Password

Update



Upload Photo Page

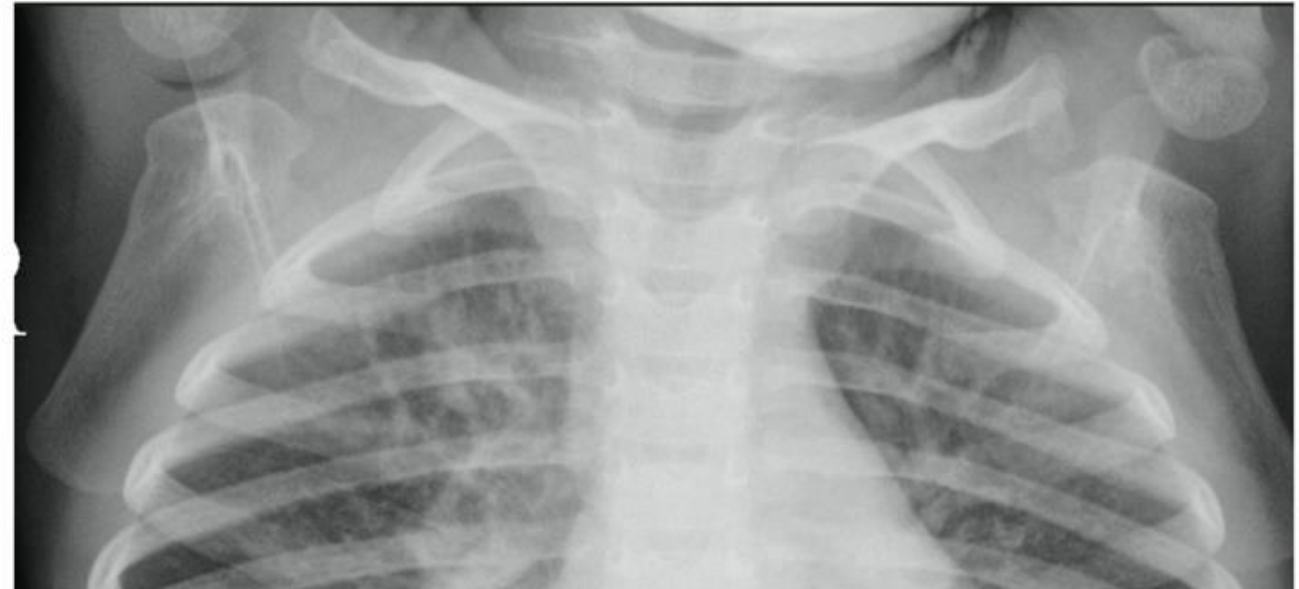
On this page, you can upload your x-ray image to the system to be examined

UPLOAD

Specify Your X-Ray Image To Upload

Upload Image

Image size must be less than 5MB



select image

Send Image

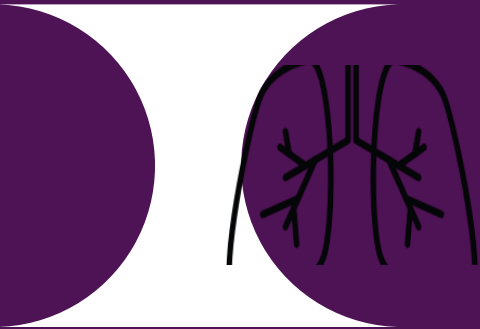
the XRay you uploaded in 2023-6-7

the result: Hey, you,I would first like to express my sympathy and wishes for a speedy recovery to you and those who love you. If you are diagnosed with pneumonia, this means that your breathing system is not working properly, and this requires immediate treatment.As a physician, I will make sure to provide you with the necessary information to improve your condition. To help with your pneumonia, get adequate rest, drink plenty of fluids, and take exactly prescribed medications as directed. I can also prescribe breathing exercises and other tools to improve lung function.

the XRay you uploaded in 2023-6-7

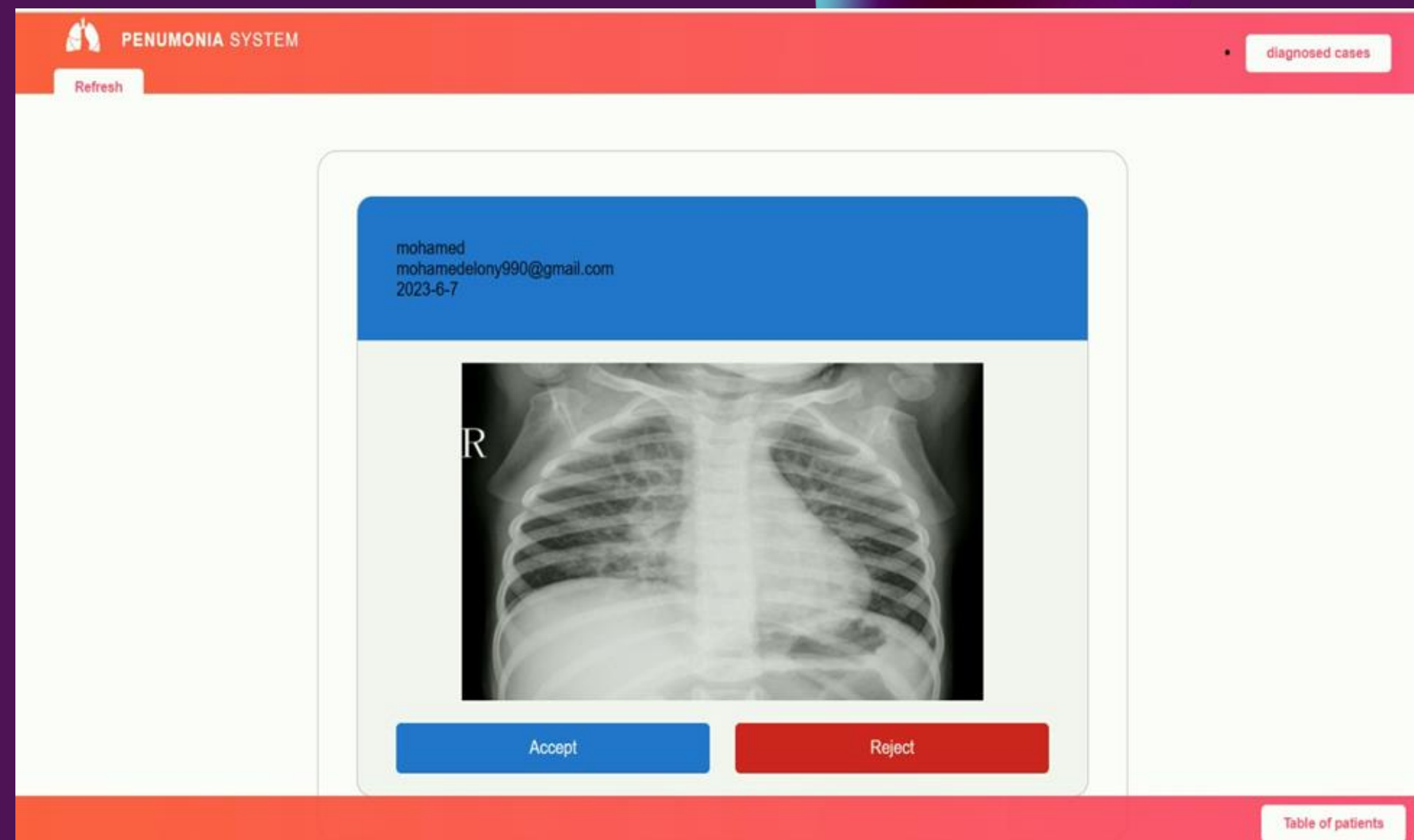
the result: Hey, you,I would first like to express my sympathy and wishes for a speedy recovery to you and those who love

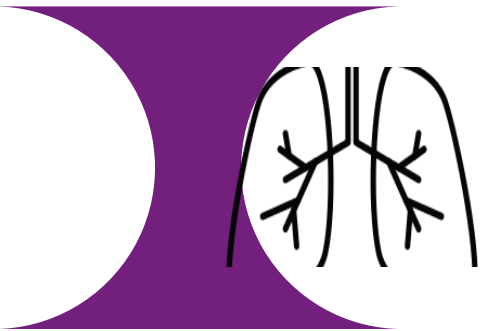
Refresh



5- Admin Page

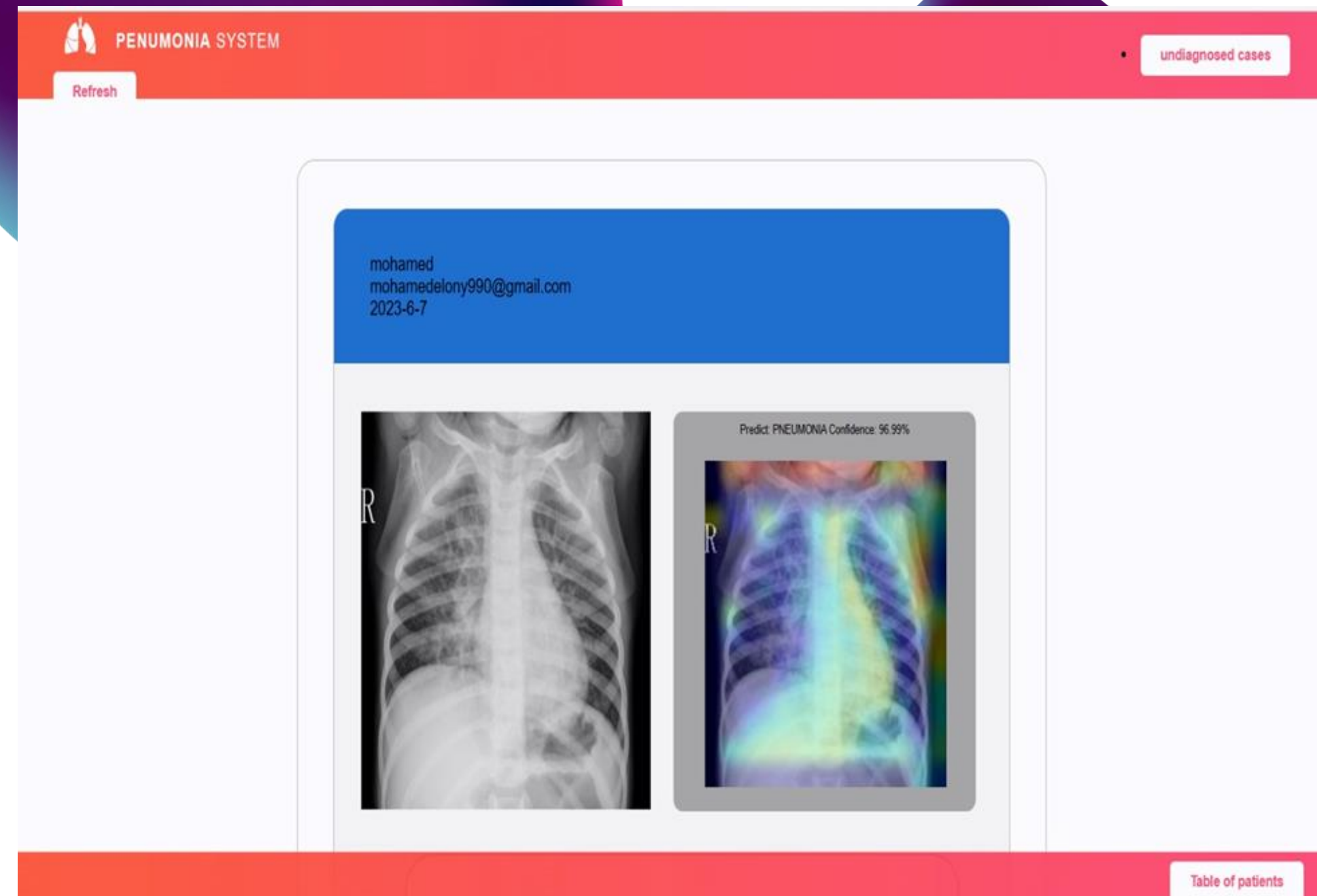
On this page, the controller is the admin, and this page can be called the undiagnosed cases page





Diagnosed Cases Page

On this page, the x-rays that have been examined are saved to be sent to the patient's e-mail



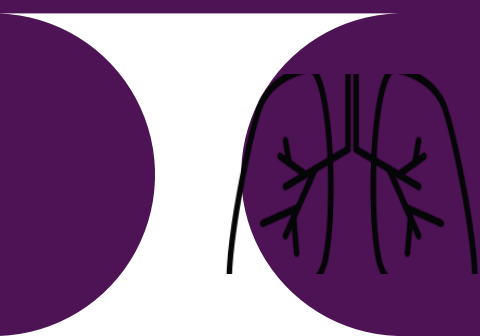

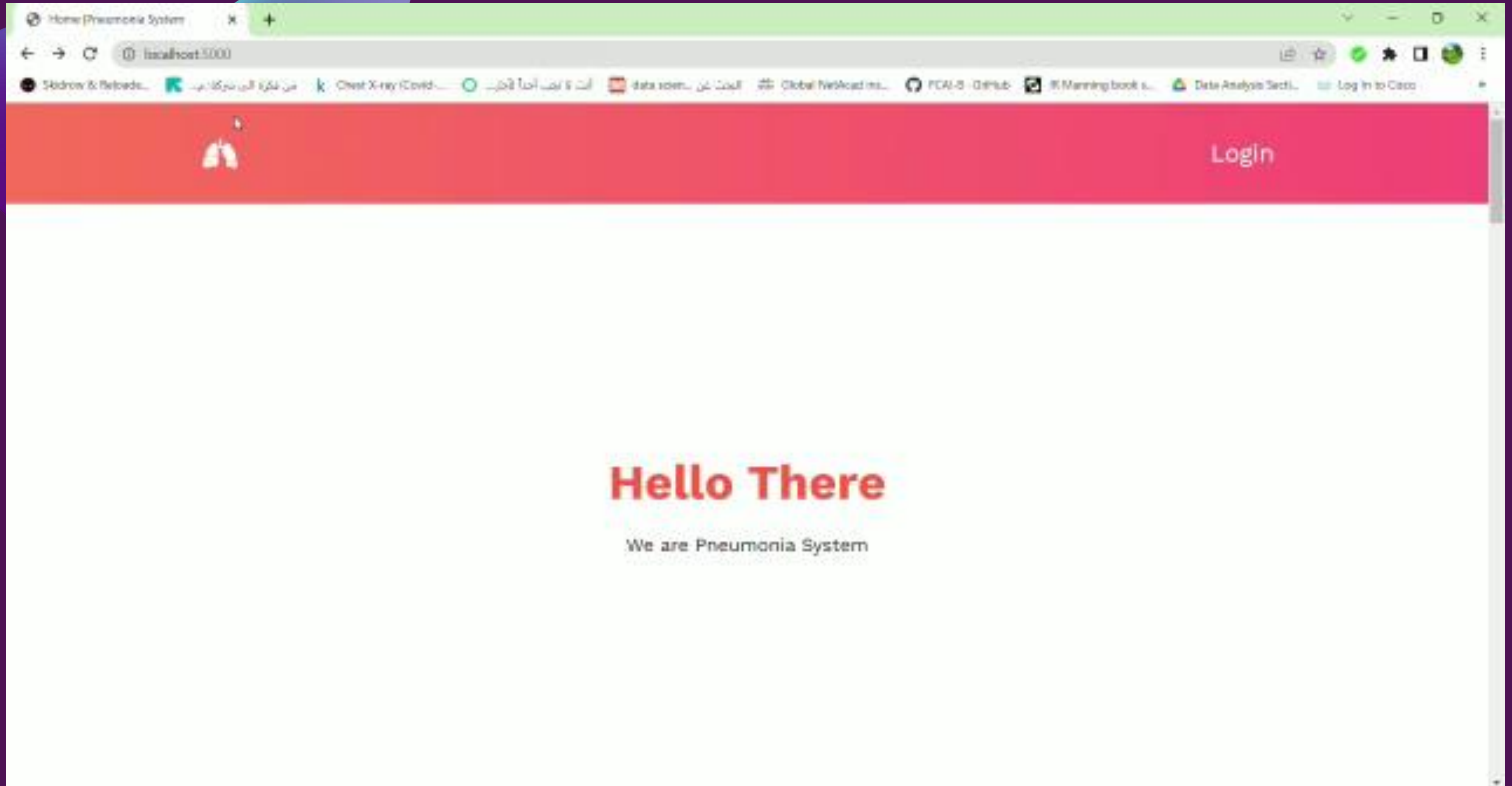


Table Of Patients

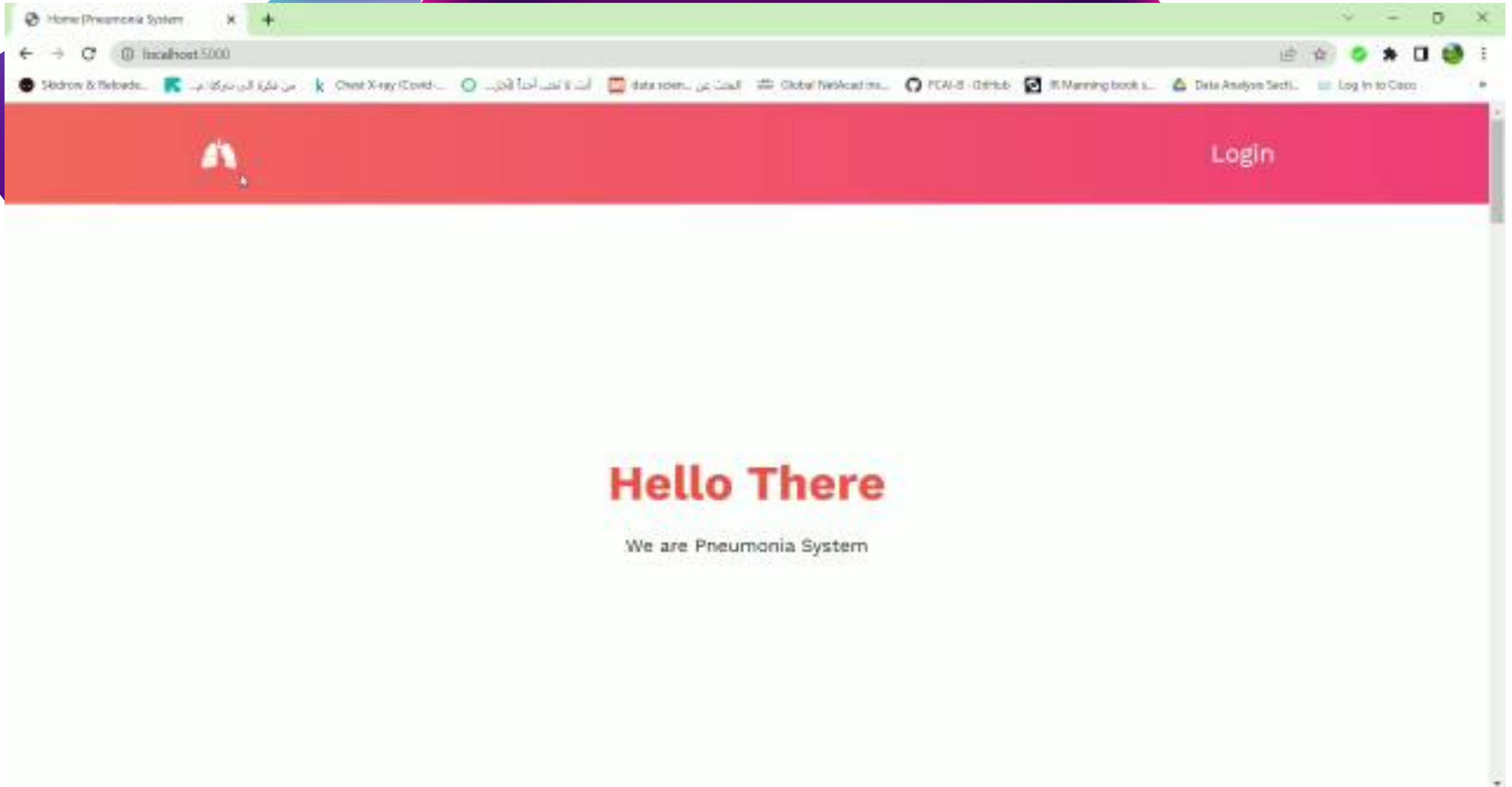
On this page, the data of all the cases on the system are displayed

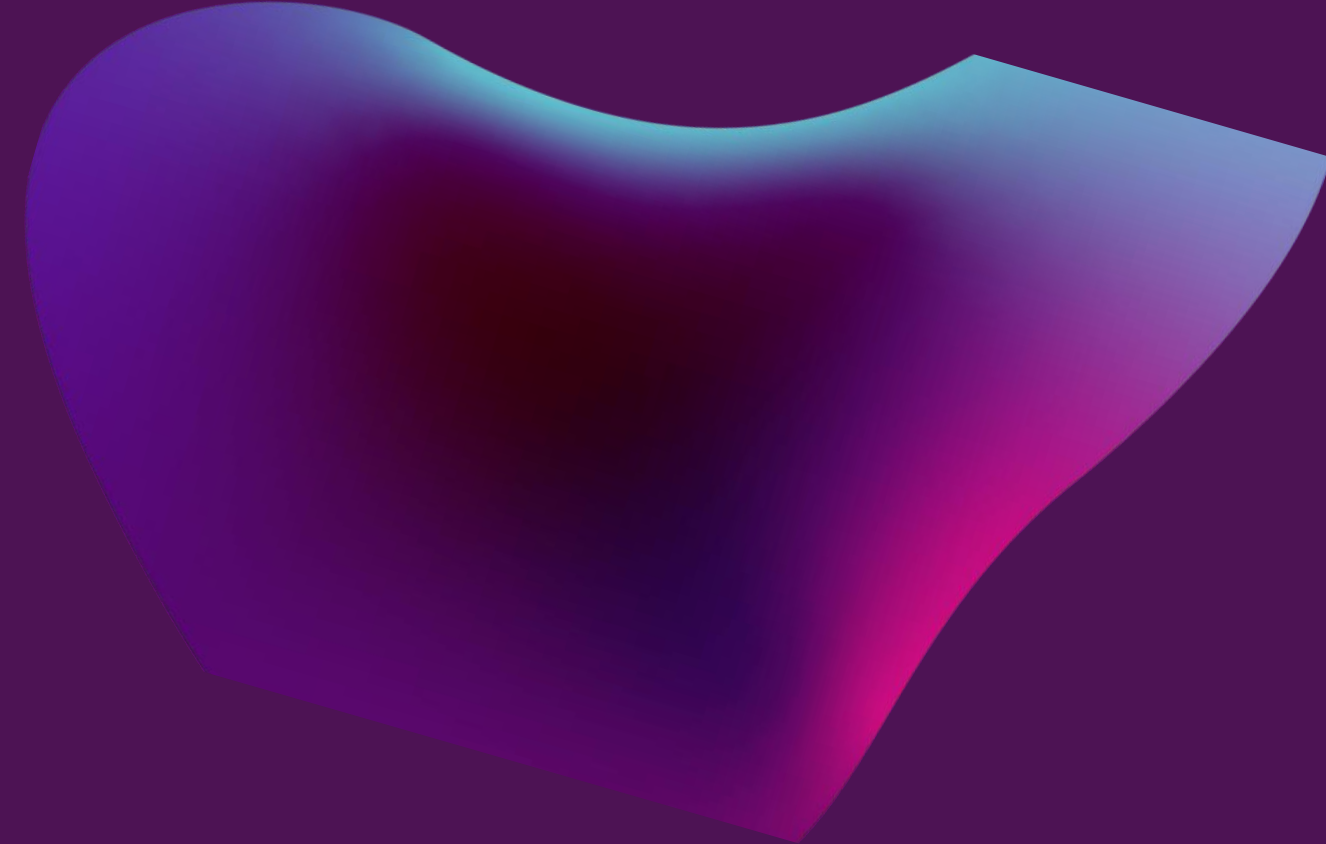
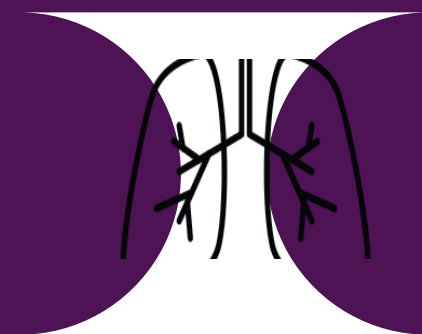
<div> PENUMONIA SYSTEM</div> <div>Refresh</div> <div>BACK</div>					
FullName	Email	XRay	Date	Diagnosis	Result
mohamed	mohamedelony990@gmail.com	10/images/WhatsApp Image 2023-04-29 at 5.52.40 PM.jpeg	2023-6-7	Predict: PNEUMONIA Confidence: 99.54%	10/results/WhatsApp Image 2023-04-29 at 5.52.40 PM.jpeg
mohamed	mohamedelony990@gmail.com	10/images/WhatsApp Image 2023-04-29 at 5.52.40 PM.jpeg	2023-6-7	Predict: PNEUMONIA Confidence: 99.54%	10/results/WhatsApp Image 2023-04-29 at 5.52.40 PM.jpeg
mohamed	mohamedelony990@gmail.com	10/images/WhatsApp Image 2023-04-29 at 5.52.36 PM.jpeg	2023-6-7	Predict: PNEUMONIA Confidence: 96.99%	10/results/WhatsApp Image 2023-04-29 at 5.52.36 PM.jpeg
mohamed	mohamedelony990@gmail.com	10/images/WhatsApp Image 2023-04-29 at 1.33.32 PM.jpeg	2023-6-7	Predict: PNEUMONIA Confidence: 96.99%	10/results/WhatsApp Image 2023-04-29 at 1.33.32 PM.jpeg
mohamed	mohamedelony990@gmail.com	10/images/WhatsApp Image 2023-04-29 at 5.52.36 PM.jpeg	2023-6-7	Predict: PNEUMONIA Confidence: 96.99%	10/results/WhatsApp Image 2023-04-29 at 5.52.36 PM.jpeg

video as “user” of system



video as “Admin” of system





♥♥ Thank you ♥♥

