

Detect Covid-19 via Chest X-Ray

Using **convolutional neural network (CNN)**

Ali Altamimi, Faisal Alasgah, 2x Ghanim, Omran



Table of contents

01

Description and
Objectives.

02

Data Preparation.

03

Exploratory Data
Analysis (EDA).

04

Modeling.

05

Tools.

06

Conclusion.

01

Description and Objectives.



Description and Objectives.



What is the
problem?



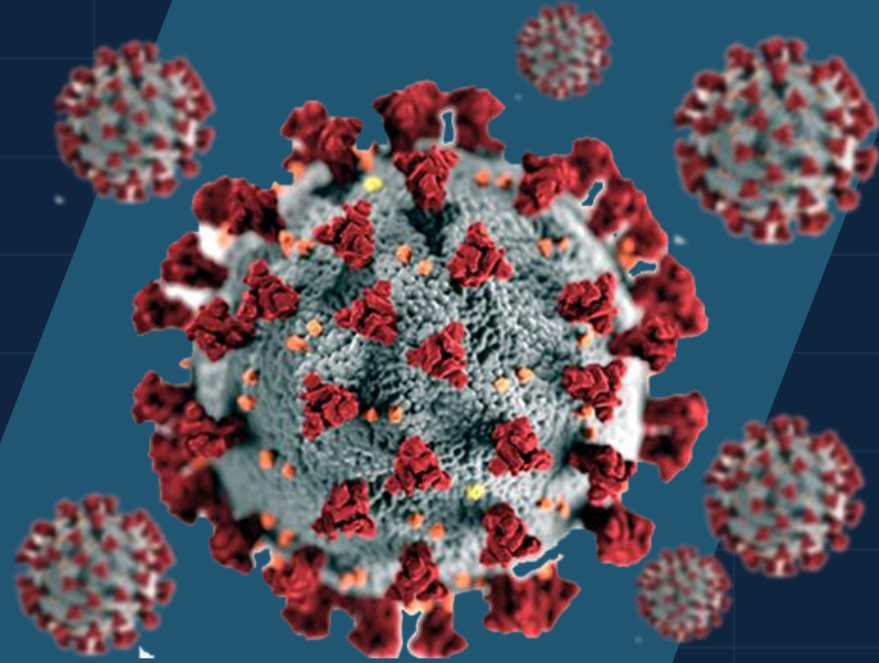
Why do we need
to work on it?



How are we
approaching the
problem?

What is the problem?

The problem that we want to solve is Covid-19



Two cartoon arms, one on the left and one on the right, are holding a large rectangular sign. The arms are light blue with darker blue outlines and are positioned vertically. The sign is a dark blue rectangle with a lighter blue border. The background is a dark blue grid.

Number of People Died

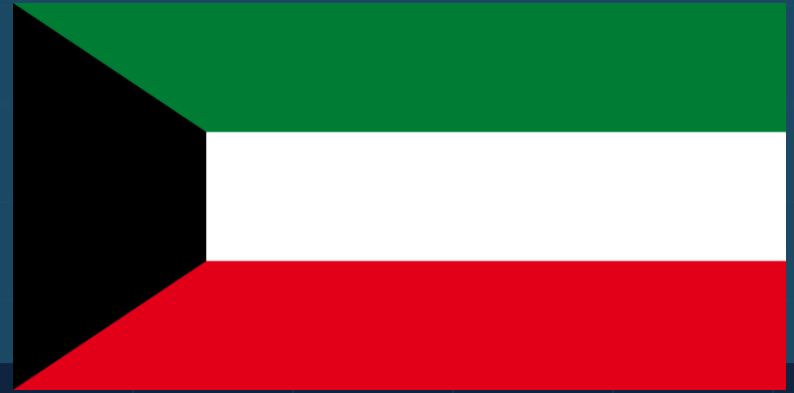
5.22M

World Wide!

As of 3/12/2021

As a Comparison

The number of people died by covid-19 virus is larger than the population of Kuwait!!



Description and Objectives.



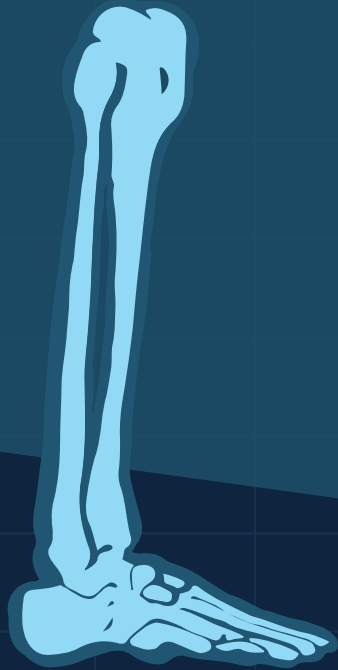
What is the
problem?



Why do we need
to work on it?



How are we
approaching the
problem?



02

Data Preparation.

Data Preparation

Source:

- Kaggle
 - X-ray Images
 - Label
 - 30,000

Data Preparation



Feature Selection

Dropped unwanted
columns



Data Cleaning

- Re-shape the images



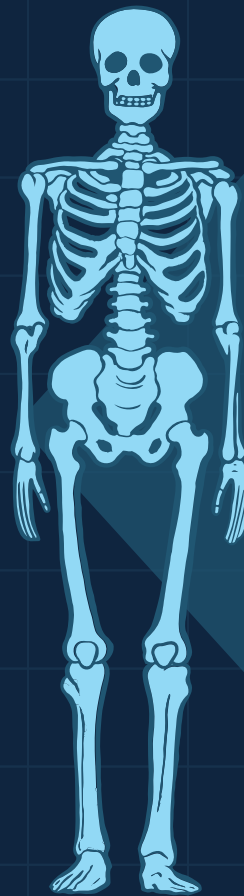
Feature Reduction

10,000 data rows

The final Dataset

After applying multiple techniques to prepare the dataset, we end up with:

- 9,000 Images for Training.
- 1,000 Images for Validation.
- 400 Images for Testing.

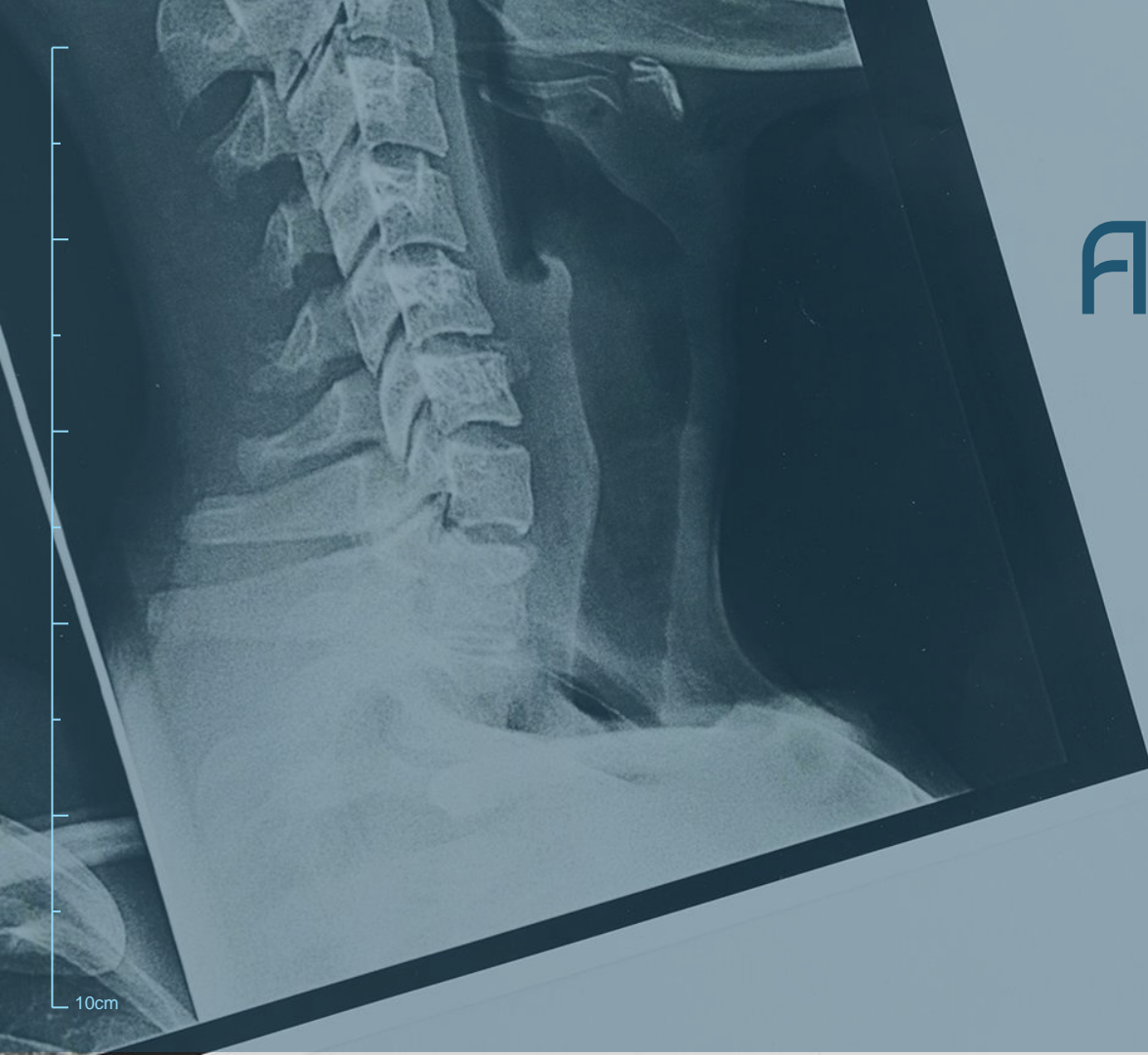


03

Exploratory Data Analysis (EDA).

10cm





A picture is
worth a
thousand
words

Data Sample

Example of Training Images

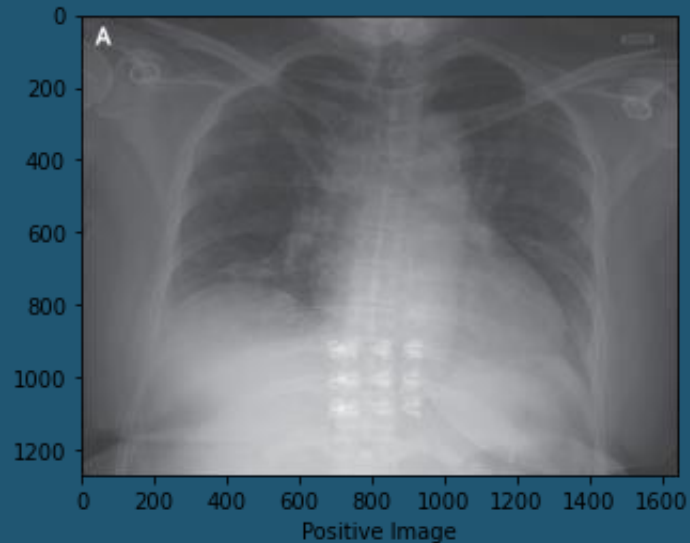
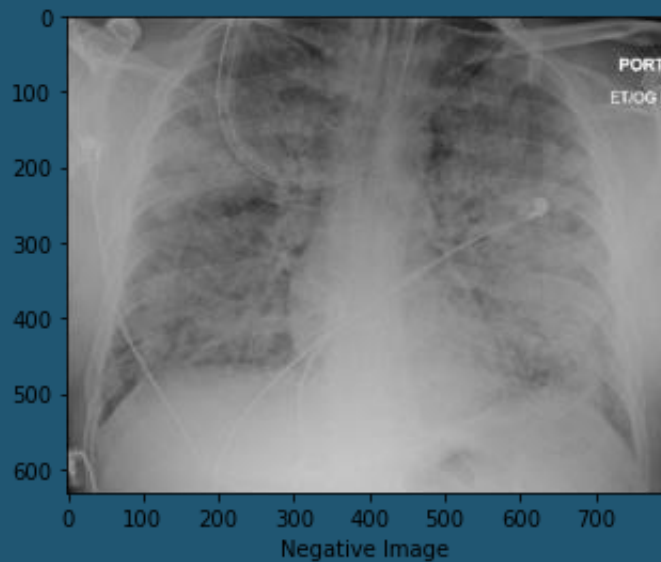
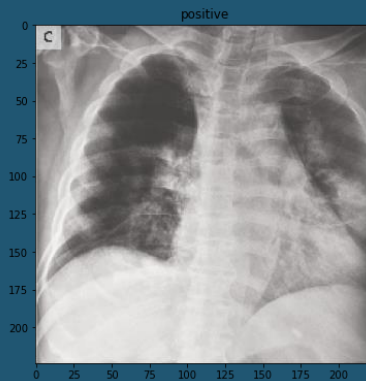
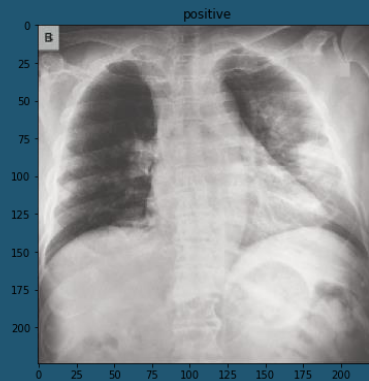
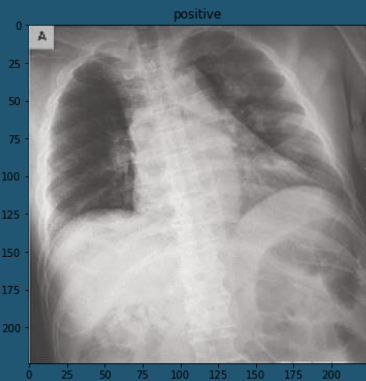
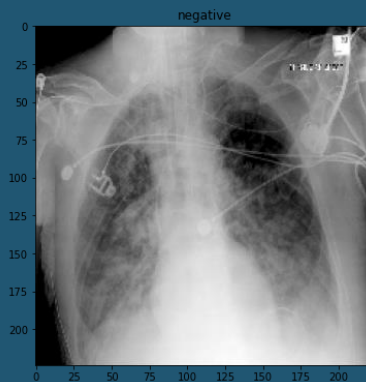
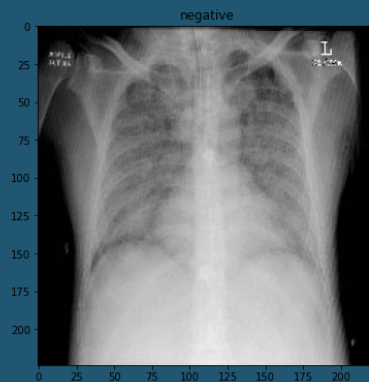
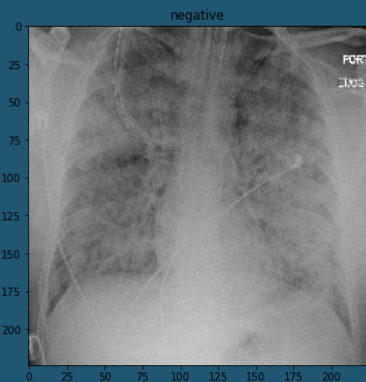
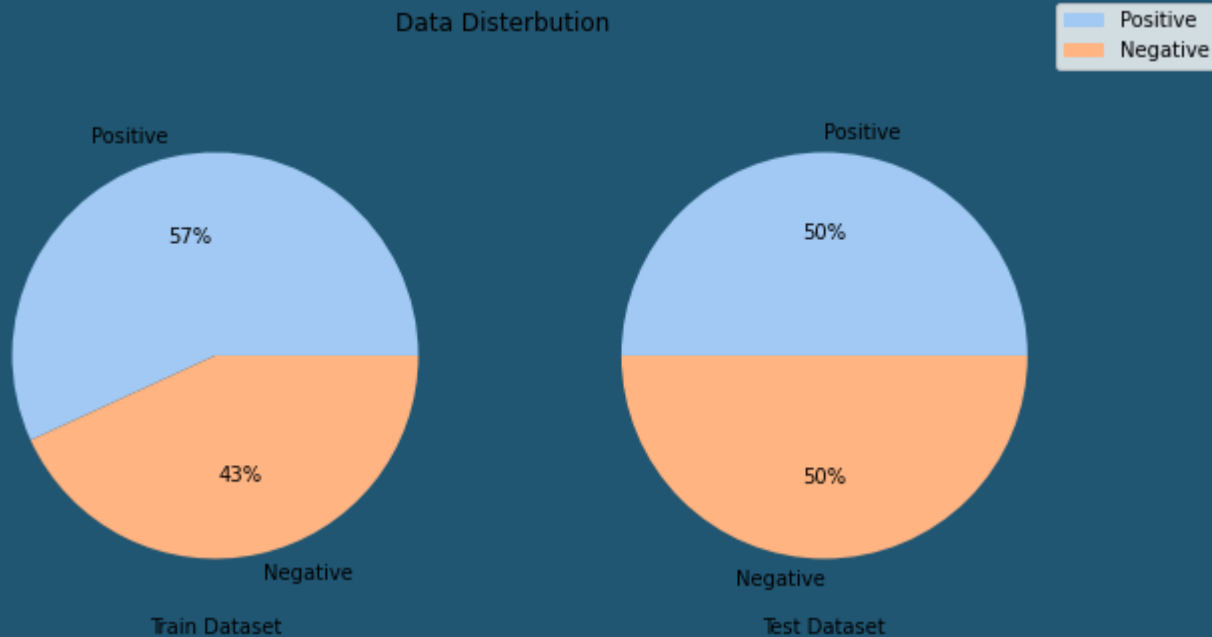


Image preprocessing

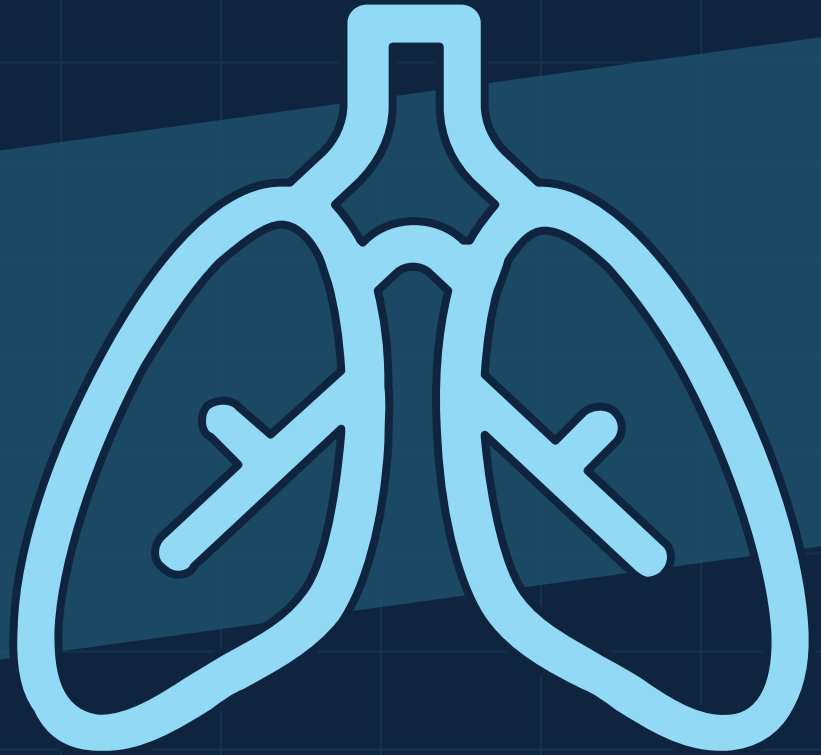


Data Distribution

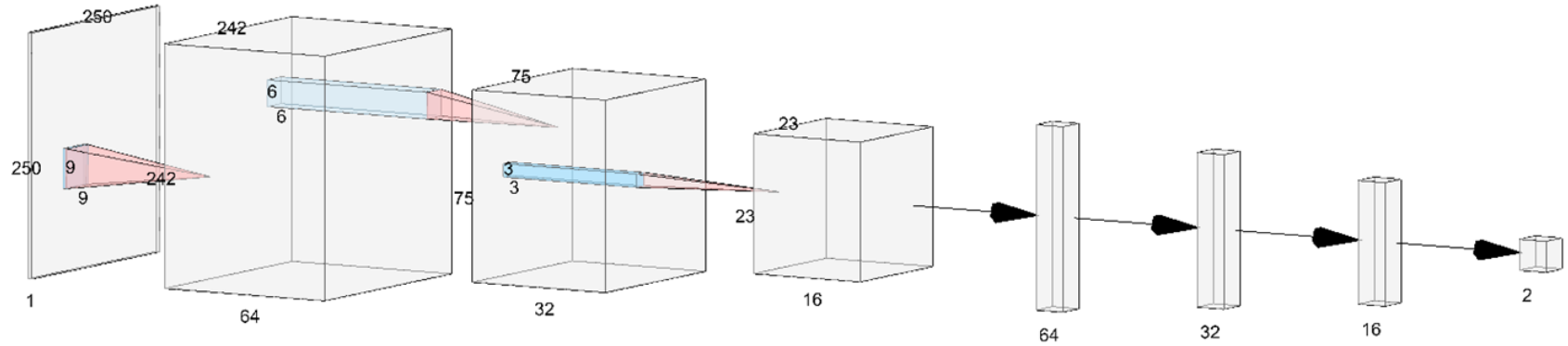


04

Modeling.



Model



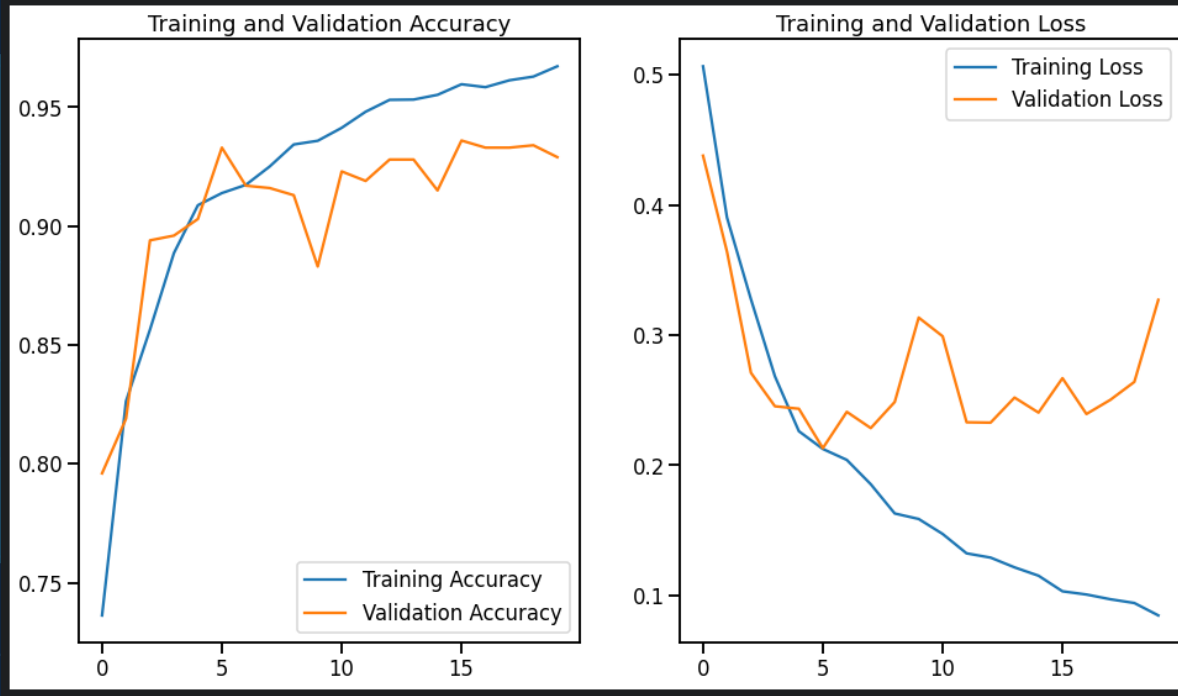
Summary

Model: "sequential_1"

Layer (type)	Output Shape	Param #
conv2d_2 (Conv2D)	(None, 242, 242, 64)	5248
activation_3 (Activation)	(None, 242, 242, 64)	0
max_pooling2d_2 (MaxPooling2D)	(None, 80, 80, 64)	0
conv2d_3 (Conv2D)	(None, 75, 75, 32)	73760
activation_4 (Activation)	(None, 75, 75, 32)	0
max_pooling2d_3 (MaxPooling2D)	(None, 25, 25, 32)	0
conv2d_4 (Conv2D)	(None, 23, 23, 16)	4624
activation_5 (Activation)	(None, 23, 23, 16)	0
max_pooling2d_4 (MaxPooling2D)	(None, 7, 7, 16)	0
flatten_1 (Flatten)	(None, 784)	0
dense_3 (Dense)	(None, 64)	50240
dense_4 (Dense)	(None, 32)	2080
dense_5 (Dense)	(None, 16)	528
dense_6 (Dense)	(None, 2)	34
activation_6 (Activation)	(None, 2)	0
Total params: 136,514		
Trainable params: 136,514		
Non-trainable params: 0		

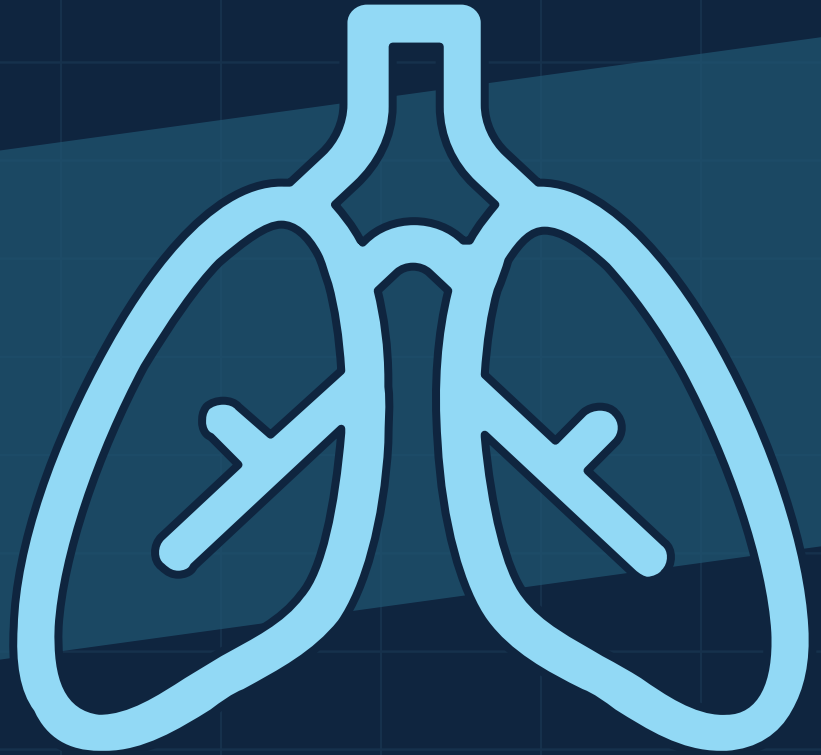
Model

Test accuracy: 0.9150000214576721



05

Tools.



Tools

Pandas

Is used for loading data
and handle data structure

Tensorflow

Used for deep learning

Seaborn

Used to visualize data

Sklearn

Used to test the the result

Numpy

For mathematical
operation

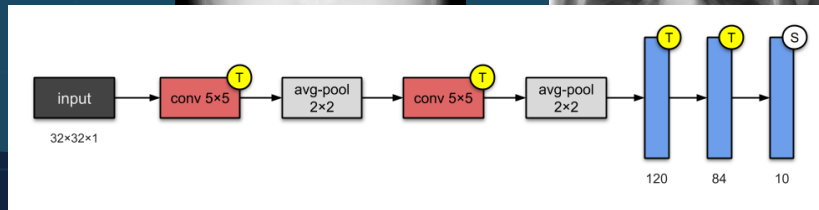
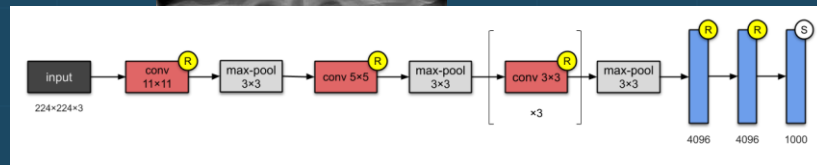
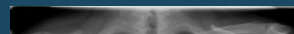
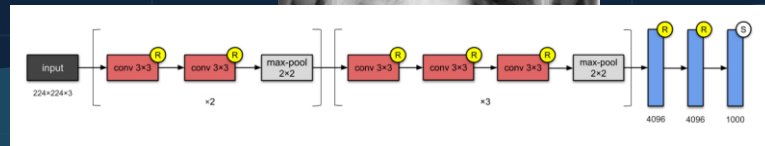


Conclusions

- The problem of covid-19
- Our data and its preparation
- The model and result

Recommendations

- This model can be used as an advising tool.
- Detect multiple diseases
- Test different architecture to have better scores.



Our team



Ali Al-tamimi



Faisal Alasgah



2x Ghanim



Omran Fallatah

Thanks!

Any questions?

