



# PNEUMONIA DETECTION USING X-RAY USING WATSON STUDIO

M.MAHESHWARI

P. SHIVANI

M. MANASA

Normal bronchiole  
and alveoli

Pneumonia causes  
an accumulation

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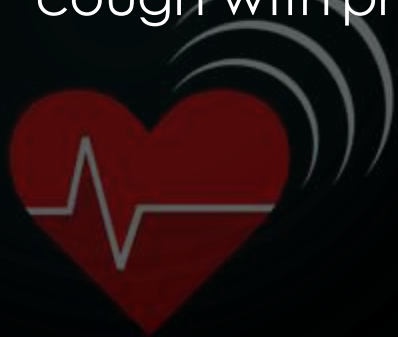
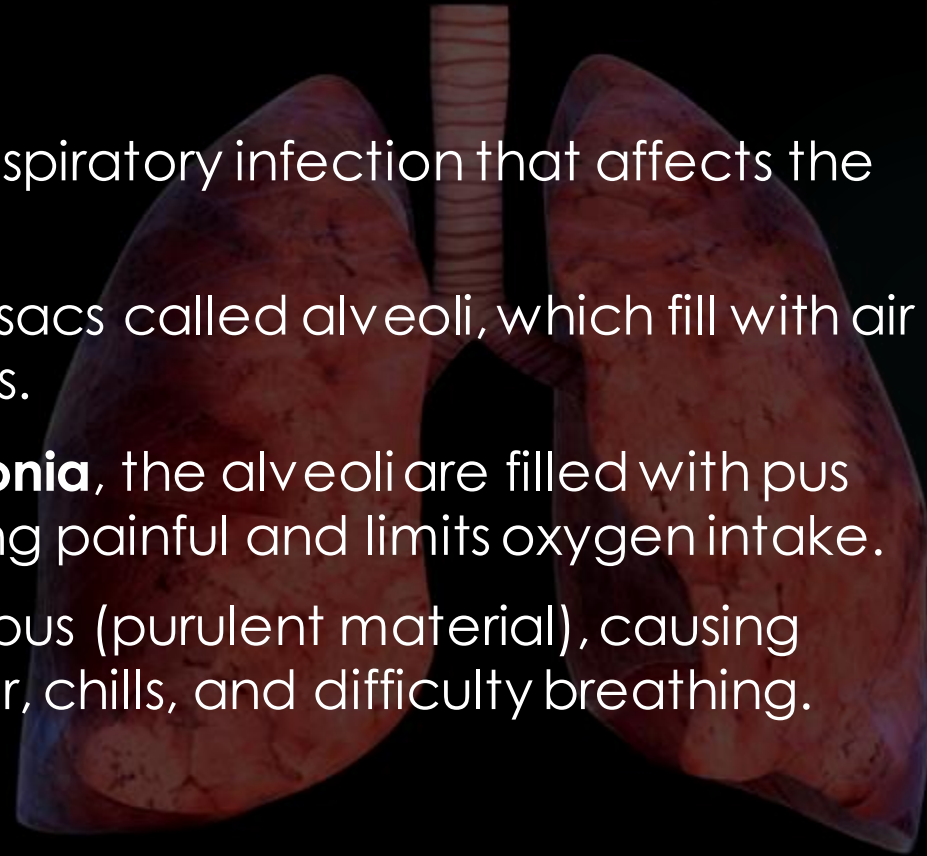
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# INTRODUCTION

- Available on iTunes
- ▶ **Pneumonia** is a form of acute respiratory infection that affects the lungs.
  - ▶ The lungs are made up of small sacs called alveoli, which fill with air when a healthy person breathes.
  - ▶ When an individual has **pneumonia**, the alveoli are filled with pus and fluid, which makes breathing painful and limits oxygen intake.
  - ▶ The air sacs may fill with fluid or pus (purulent material), causing cough with phlegm or pus, fever, chills, and difficulty breathing.



IDSA



# PURPOSE

płaz  
anatomiczny

PŁATOWE

- ▶ Pneumonia is an infection in one or both lungs. Bacteria, viruses, and fungi cause it.

- ▶ Aspiration pneumonia happens when you inhale bacteria into your lungs from food, drink, or saliva. This type is more likely to occur if you have a swallowing problem or if you're too sedate from the use of medications, alcohol, or other drugs.

- ▶ This type of bacterial pneumonia is acquired during a hospital stay. It can be more serious than other types, as the bacteria involved may be more resistant to antibiotics.

- ▶ Pneumonia can be caused by a wide variety of bacteria, viruses and fungi in the air we breathe. Identifying the cause of your pneumonia can be an important step in getting the proper treatment.

ŚRÓDMIAŻSZOWE

ODOSKRZELOWE

neutrofile

obrzęk przegród

limfocyty

obrzęk przegród

neutrofile

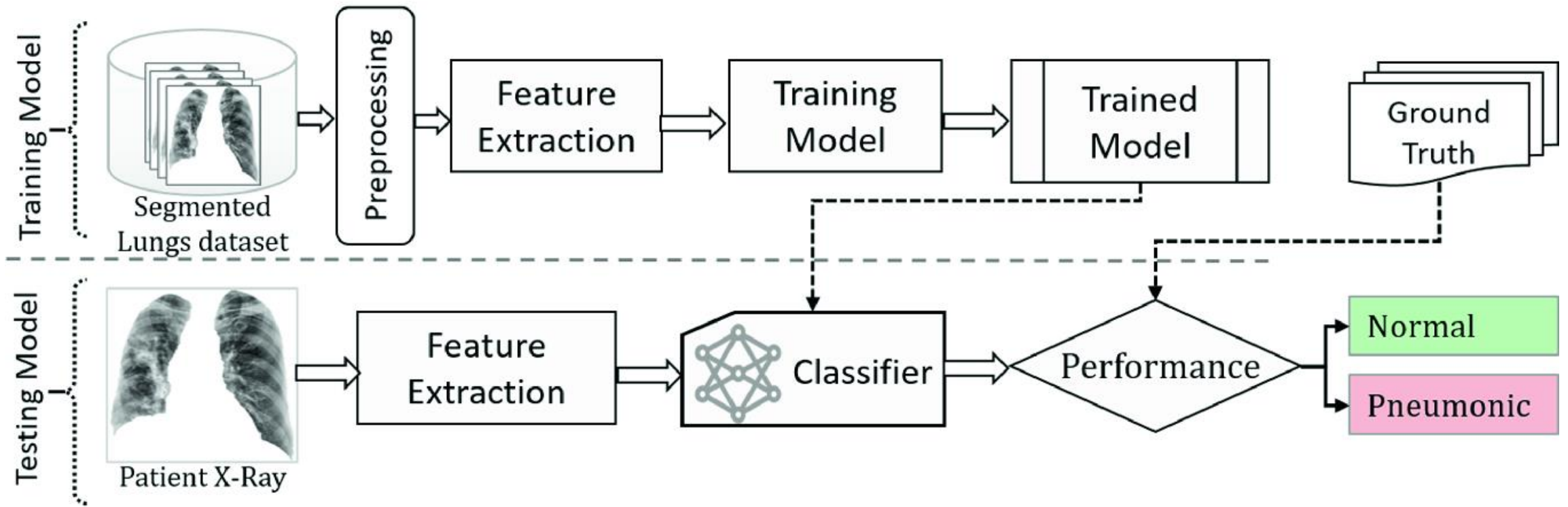
obrzęk ściany

# TRAINING THE MACHINE

- ▶ Define adequately our problem (objective, desired outputs...).
- ▶ Gather data.
- ▶ Choose a measure of success.
- ▶ Set an evaluation protocol and the different protocols available.
- ▶ Prepare the data (dealing with missing values, with categorical values...).
- ▶ Split correctly the data.
- ▶ Differentiate between over and underfitting, defining what they are and explaining the best ways to avoid them.
- ▶ An overview of how a model learns.
- ▶ What is regularization and when is appropriate to use it.
- ▶ Develop a benchmark model.
- ▶ Choose an adequate model and tune it to get the best performance possible.

# TESTING THE MACHINE

- ▶ Depending on the affected person's medical history and the signs and symptoms that are present at the time of the physical exam, a number of laboratory tests may be performed to help make a diagnosis.
- ▶ The model is to be tested with different images to know if it is predicting correctly.
- ▶ Pre-processing the image includes converting the image to array and resizing according to the model. And given pre-processed image to the model to know to which class your model belongs to.





# ADVANTAGES AND DIS- ADVANTAGES

## ► ADVANTAGES

1. Sharing with team
2. Github integration
3. Free pricing plan if you want to try things out

## ► DIS-ADVANTAGES

1. Loading times can be slow
2. Tabs can be hard to navigate
3. not enough out of box examples

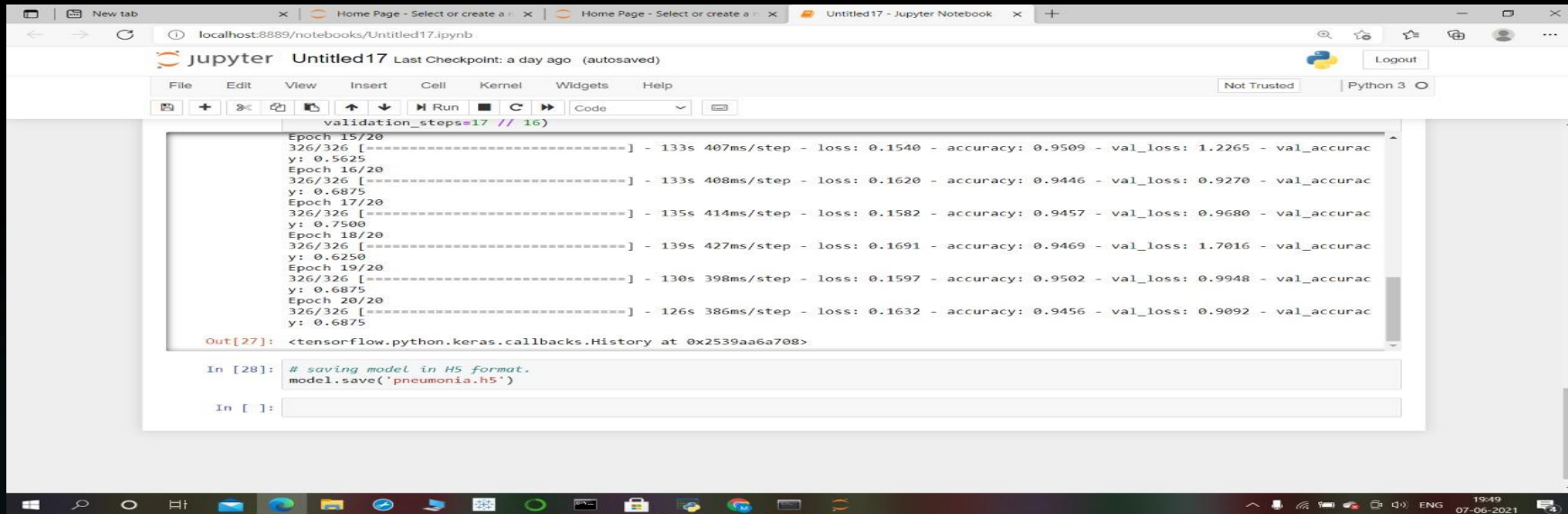


# APPLICATION

- ▶ The main application of this model is to predict the provided image is pneumonia effected xray or not
- ▶ It is well instructed so that it will predicate the correct data detection which was done using watson studio

PURPOSE?

# RESULT



```
validation_steps=17 // 16)
Epoch 15/20
326/326 [=====] - 133s 407ms/step - loss: 0.1540 - accuracy: 0.9509 - val_loss: 1.2265 - val_accuac
y: 0.5625
Epoch 16/20
326/326 [=====] - 133s 408ms/step - loss: 0.1620 - accuracy: 0.9446 - val_loss: 0.9270 - val_accuac
y: 0.6875
Epoch 17/20
326/326 [=====] - 135s 414ms/step - loss: 0.1582 - accuracy: 0.9457 - val_loss: 0.9680 - val_accuac
y: 0.7500
Epoch 18/20
326/326 [=====] - 139s 427ms/step - loss: 0.1691 - accuracy: 0.9469 - val_loss: 1.7016 - val_accuac
y: 0.6250
Epoch 19/20
326/326 [=====] - 130s 398ms/step - loss: 0.1597 - accuracy: 0.9502 - val_loss: 0.9948 - val_accuac
y: 0.6875
Epoch 20/20
326/326 [=====] - 126s 386ms/step - loss: 0.1632 - accuracy: 0.9456 - val_loss: 0.9092 - val_accuac
y: 0.6875
Out[27]: <tensorflow.python.keras.callbacks.History at 0x2539aa6a708>
In [28]: # saving model in H5 format.
model.save('pneumonia.h5')
In [ ]:
```

# CONCLUSION

- ▶ Is a common terminal event in advanced dementia for which many patients receive parenteral antibiotics. The aggressiveness of treatment is most strongly determined by advance care planning, the patient's cultural background, and clinical features of the suspected **pneumonia**.
- ▶ Without pre-trained Keras model, the train accuracy is 97.5% and validation accuracy is 90.0%. The validation result had a best figure of 91.09% as accuracy. It is observed that without using pre-trained Keras model, although the training accuracy is >90%, the overall accuracy is low unlike where pre-trained model is used.



