Pneumonia Chest X-ray Diagnosis System

Metis Bootcamp - Deep Learning Module

Andy Wang

INTRODUCTION

Pneumonia: Inflammation of the air sacs in the lung

- 16% of all death of children under 5 years old in the world
- Most common reason for US children to be hospitalized
- Most common cause of hospital admission for US adults

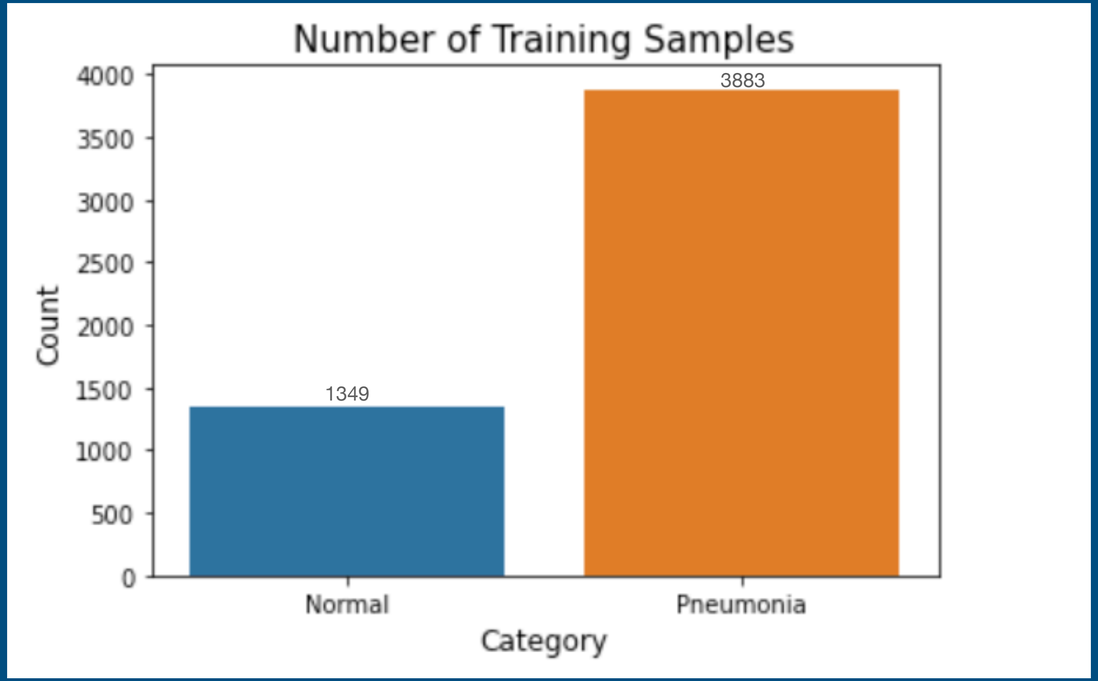
American Thoracic Society

GOAL

Build a deep learning model to aid
in rapid evaluation of chest X-ray

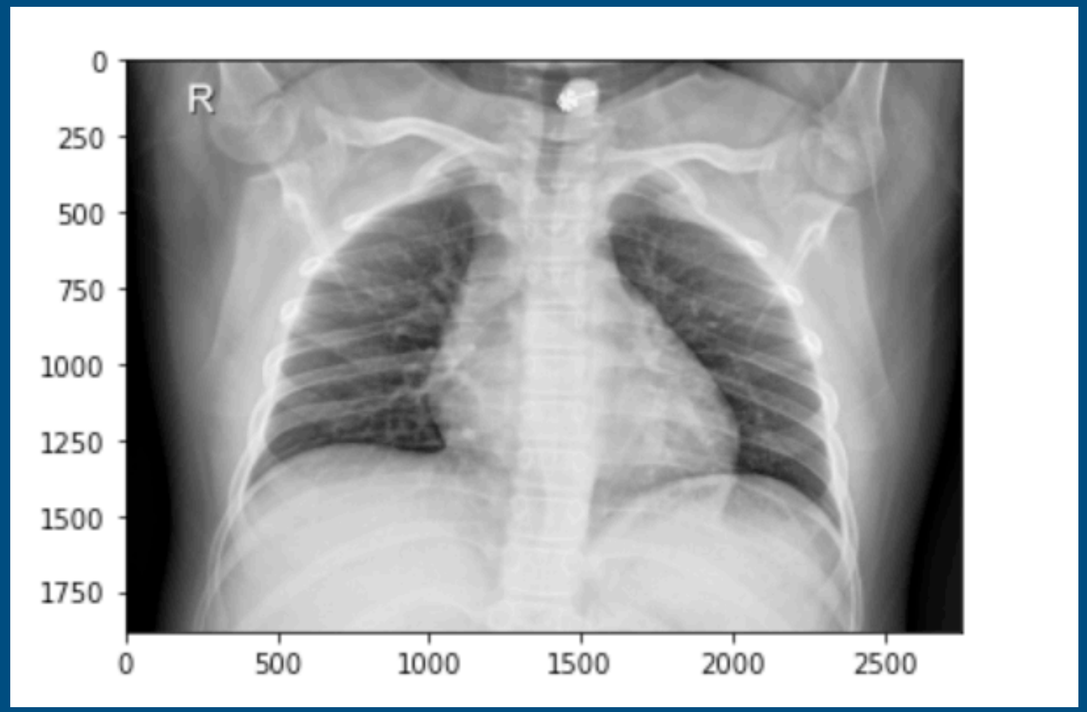
DATA

Pneumonia Chest X-ray Image dataset from Kaggle

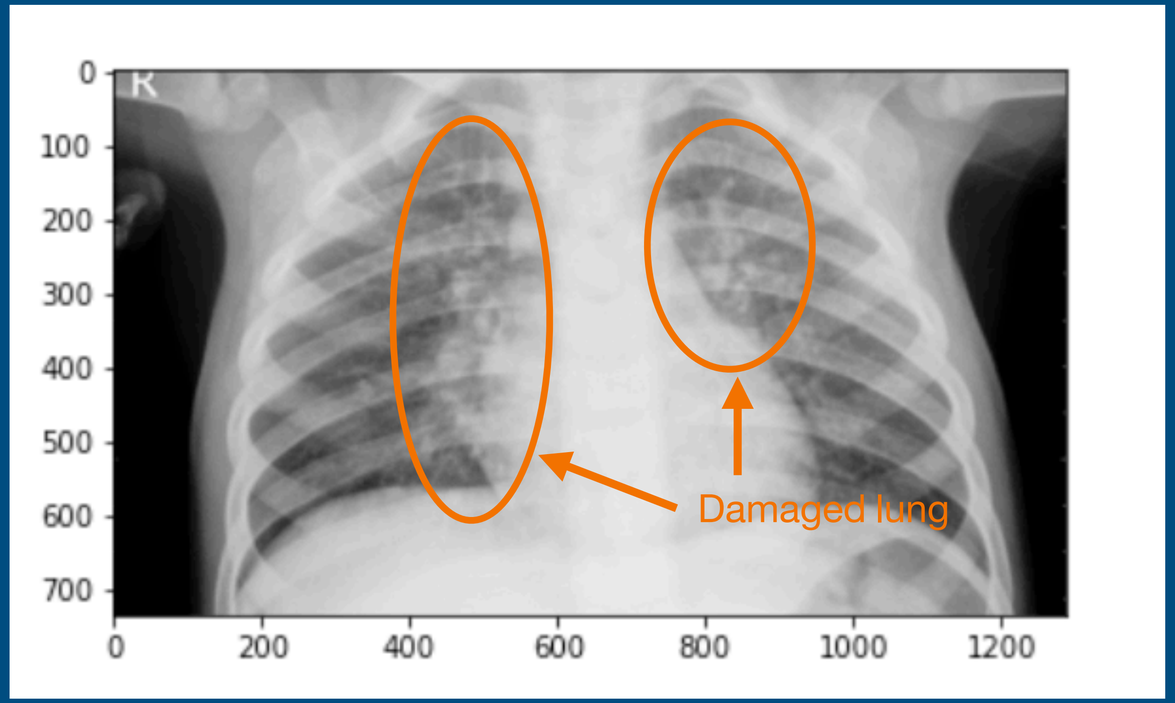


DATA

Normal



Pneumonia

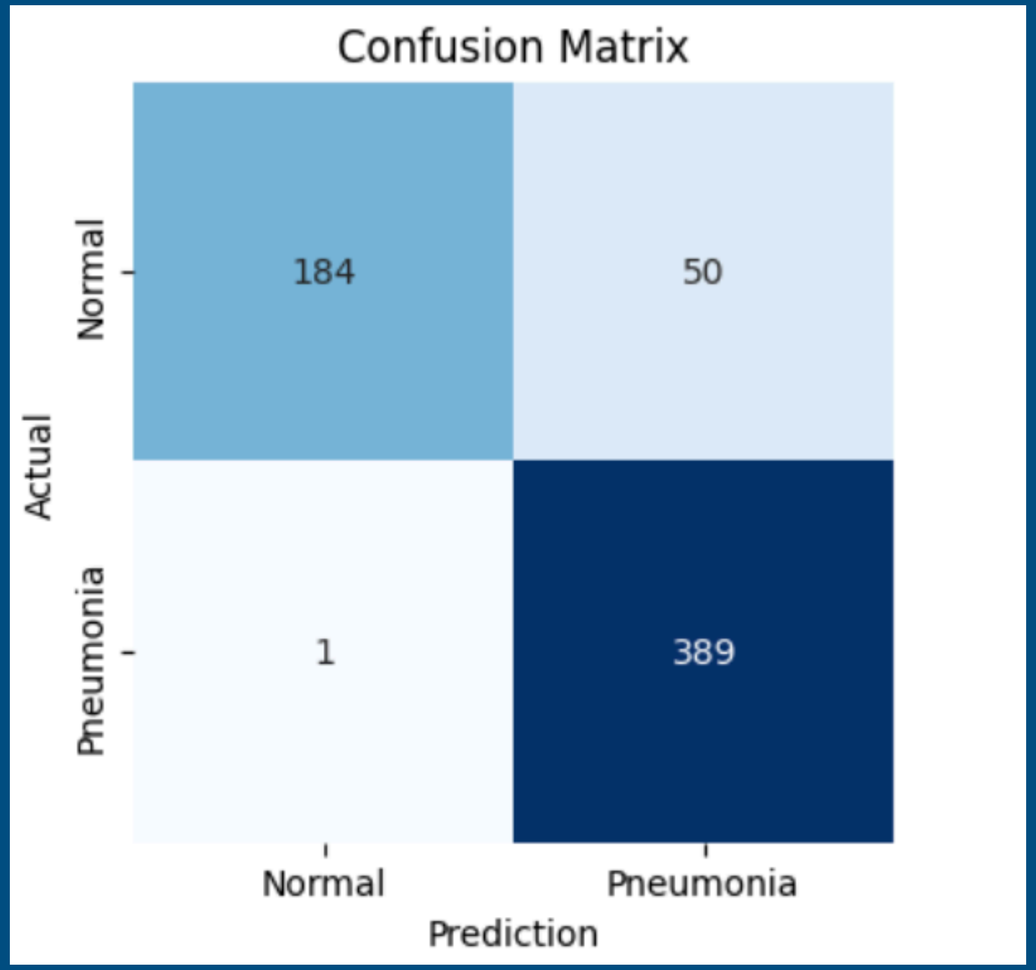


RESULT

	Final Model
Recall	1*
Precision	0.89
Accuracy	0.92

* Recall of 1 is most likely rounded up by the sklearn classification report function

RESULT


Confusion Matrix
Normal
Pneumonia
Actual
184
50
1
389
Normal
Pneumonia
Prediction

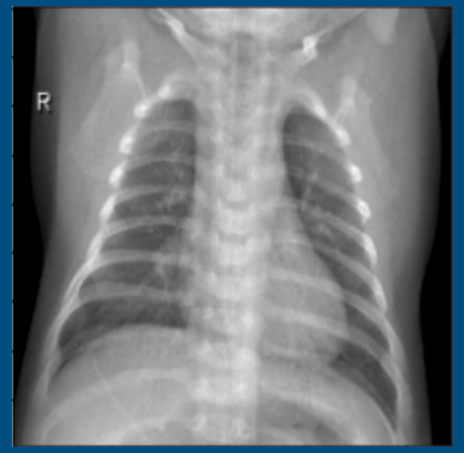
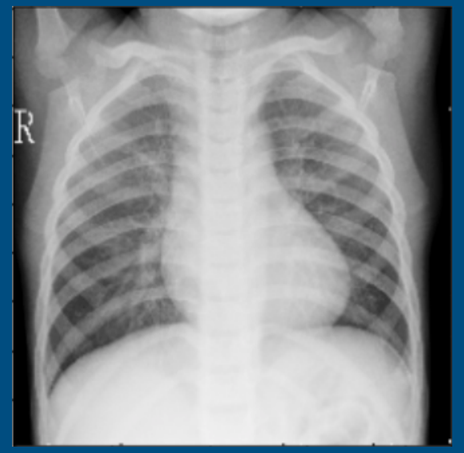
RESULT

"Healthy Individual"

True Negative


"Just to be Safe"

False Positive

"This is Bad"

False Negative

"Precise Diagnosis"

True Positive


CONCLUSION & FUTURE WORK

- Deep learning pneumonia X-ray diagnosis system can provide accurate result
- Adding more training images
- Using the AUC metric in Keras

Thank you

APPENDIX

- Optimizer: adam
- Loss function: binary crossentropy
- Metric: accuracy