

DETECTING PNEUMONIA IN CHEST X-RAYS

Tia Plagata



WHAT IS PNEUMONIA?

An acute respiratory infection that
affects the lungs



“ *About 1 million adults in the US seek care in a hospital due to pneumonia every year, and 50,000 die from this disease.*

- *American Thoracic Society (2019)*

READING CHEST X-RAYS

Normal Chest X-Ray

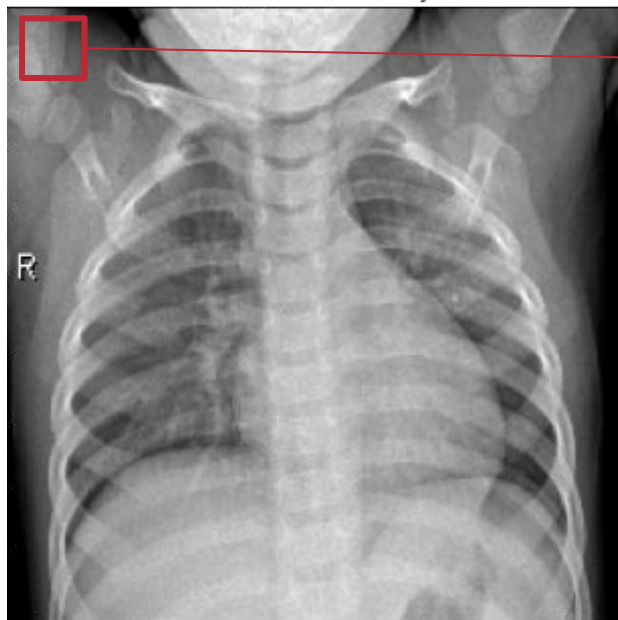


Pneumonia Chest X-Ray



WHAT IS A CONVOLUTIONAL NEURAL NETWORK?

Normal Chest X-Ray

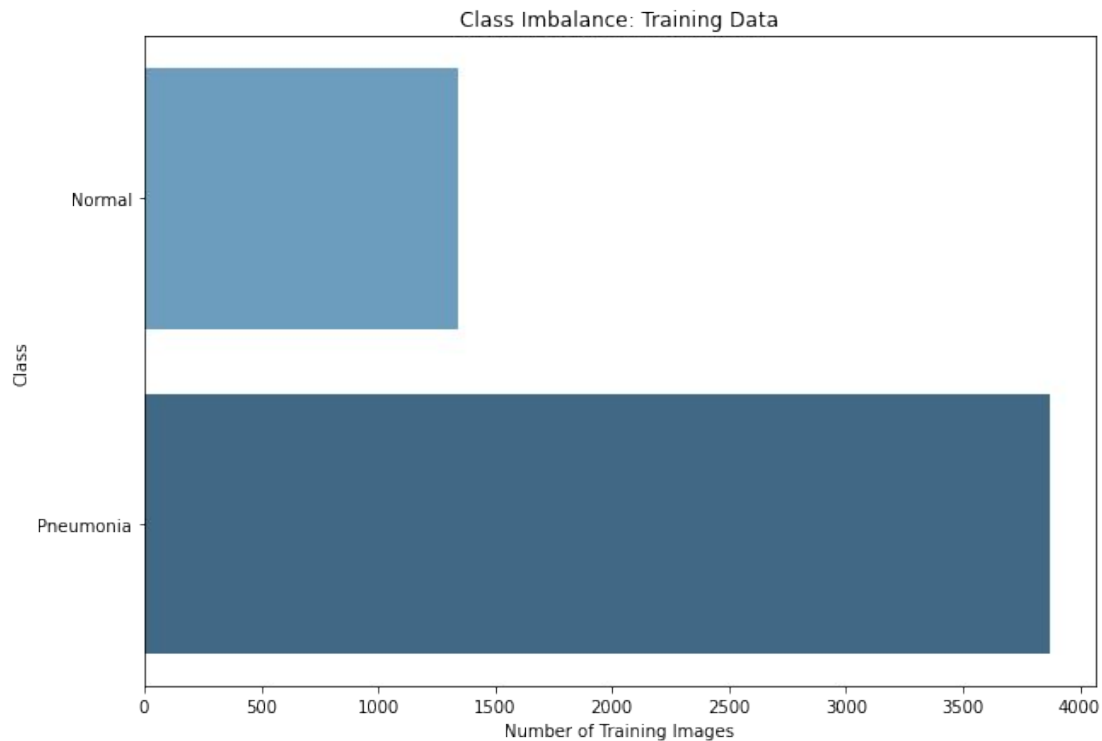




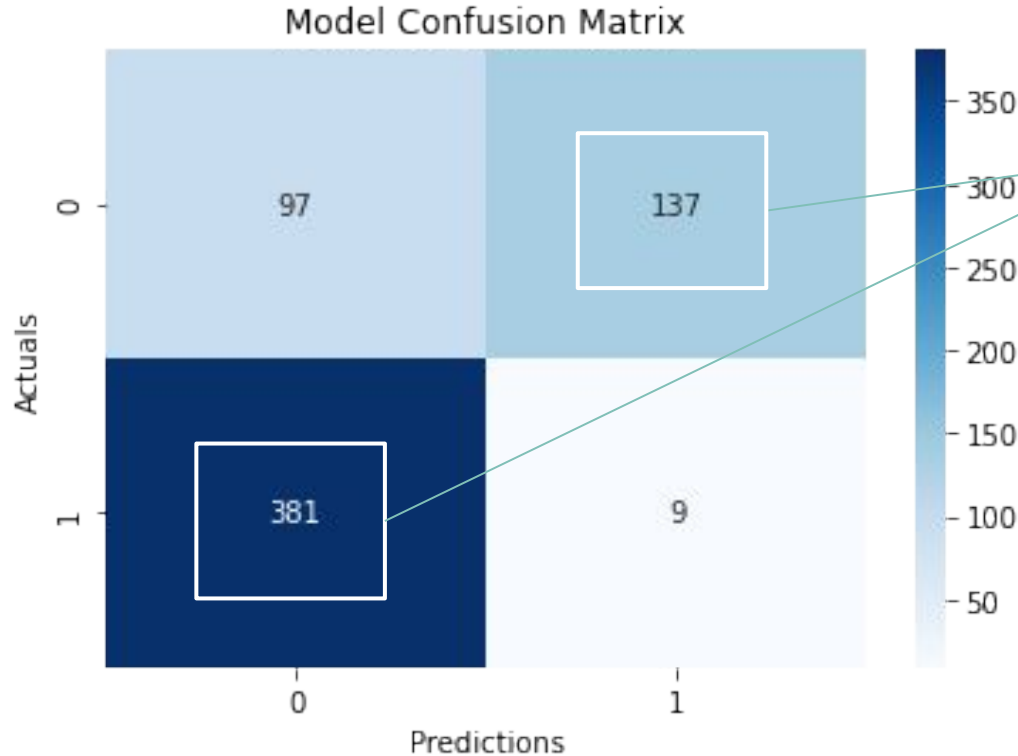
LET'S USE CNNs!

They're perfect for this use-case

THE CHALLENGE



THE RESULTS

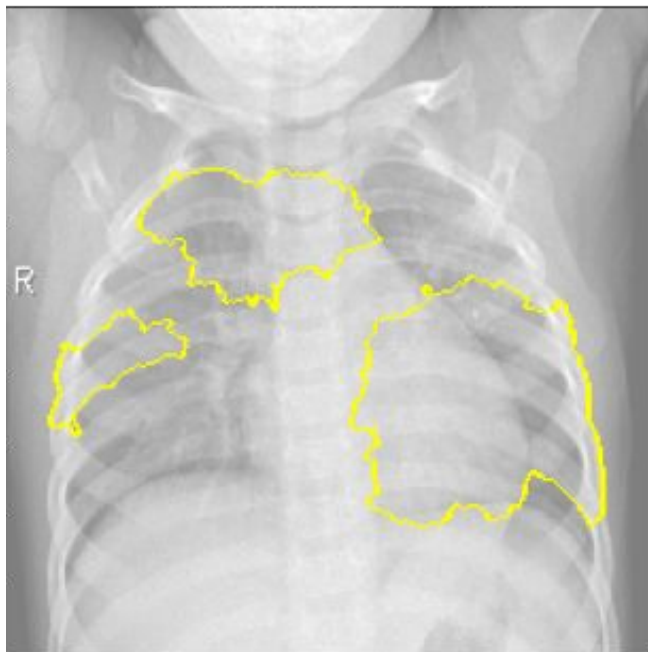


*We want to reduce False Negatives, and False Positives

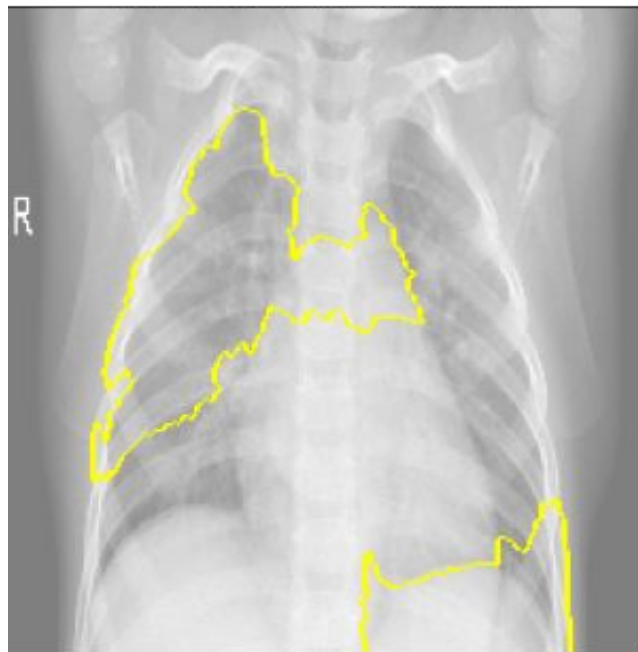
Overall Accuracy:
82%

THE RESULTS

Correct Normal Classification



Incorrect Pneumonia Classification



RECOMMENDATIONS

- Use the model as a tool to improve efficiency



RECOMMENDATIONS

- Ask tech to crop out diaphragm before feeding to model
- Save images as 224 x 224 px before uploading to model



FUTURE WORK

Pre-processing

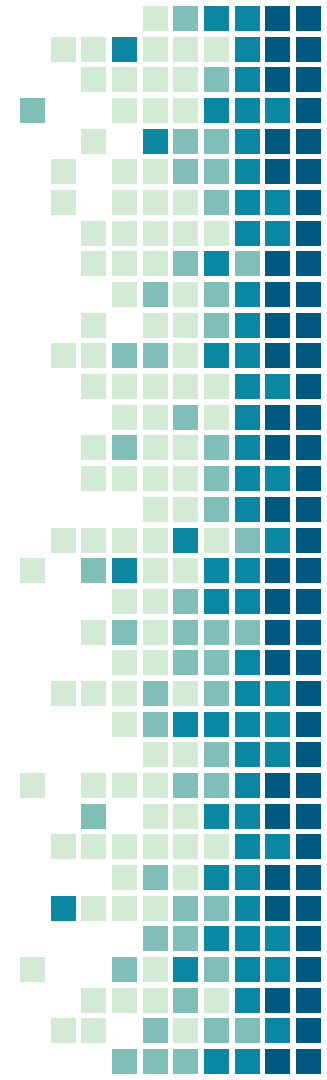
- Remove diaphragm
- Make images smaller

Fine-Tuning

- Unfreezing certain layers of transfer-learning base

More Research

- Research more successful tuning methods



THANKS!

Any questions?

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APPENDIX: MODEL VALIDATION

