DETECTING PNEUMONIA IN CHEST X-RAYS
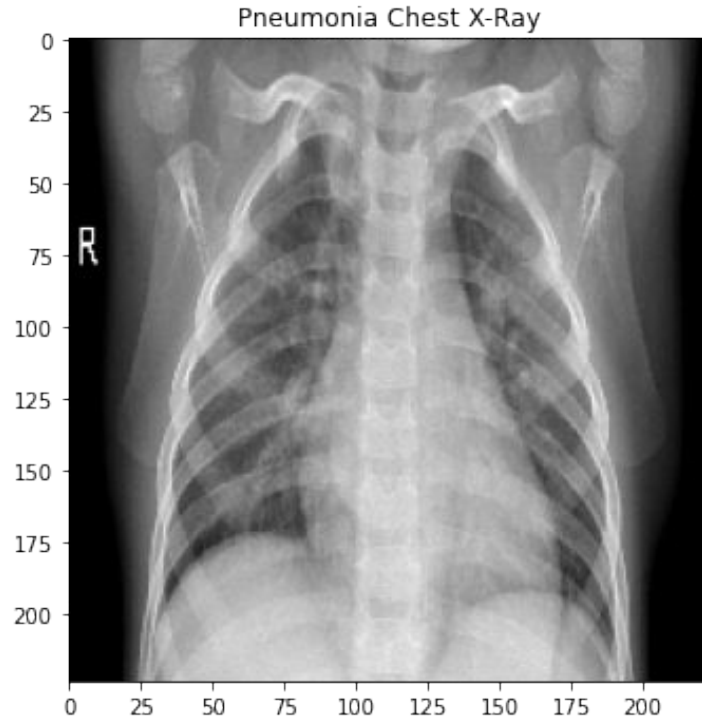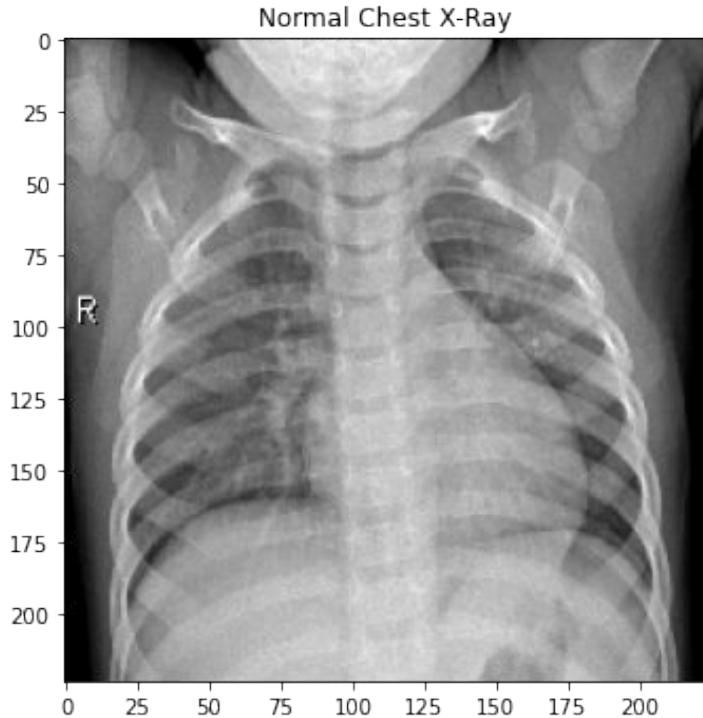
Tia Plagata

WHAT IS PNEUMONIA?
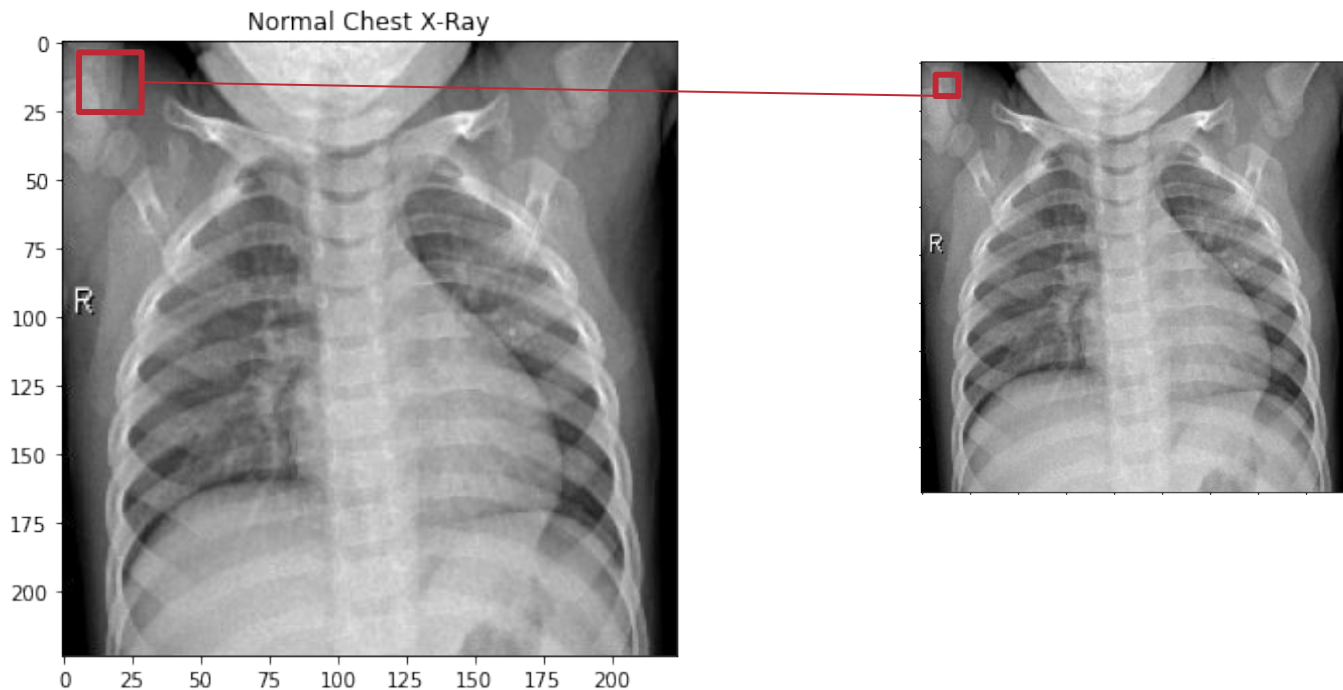
An acute respiratory infection that affects the lungs

" 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
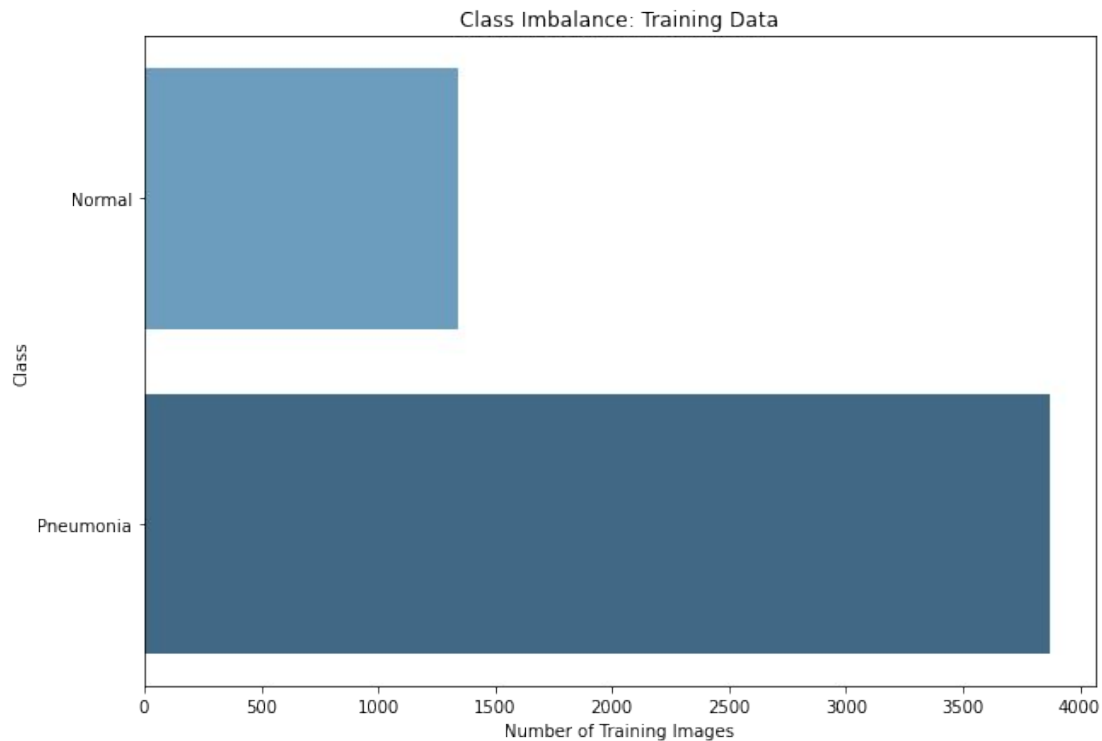
WHAT IS A CONVOLUTIONAL NEURAL NETWORK?

Normal Chest X-Ray

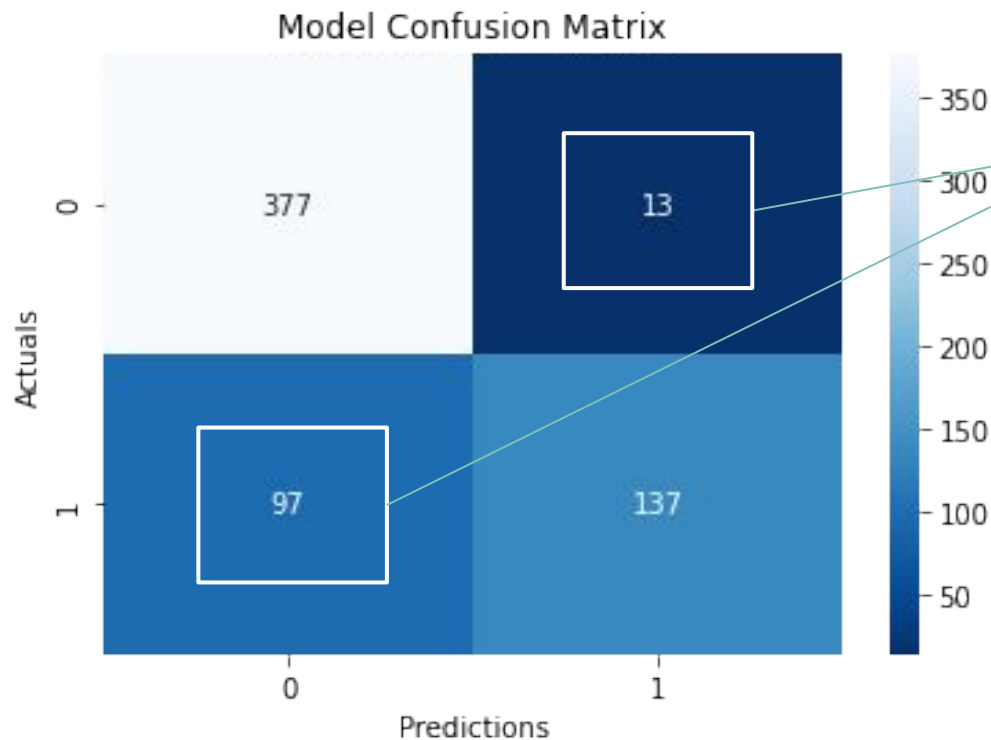# LET'S USE CNNS!

They're perfect for this use-case

THE CHALLENGE

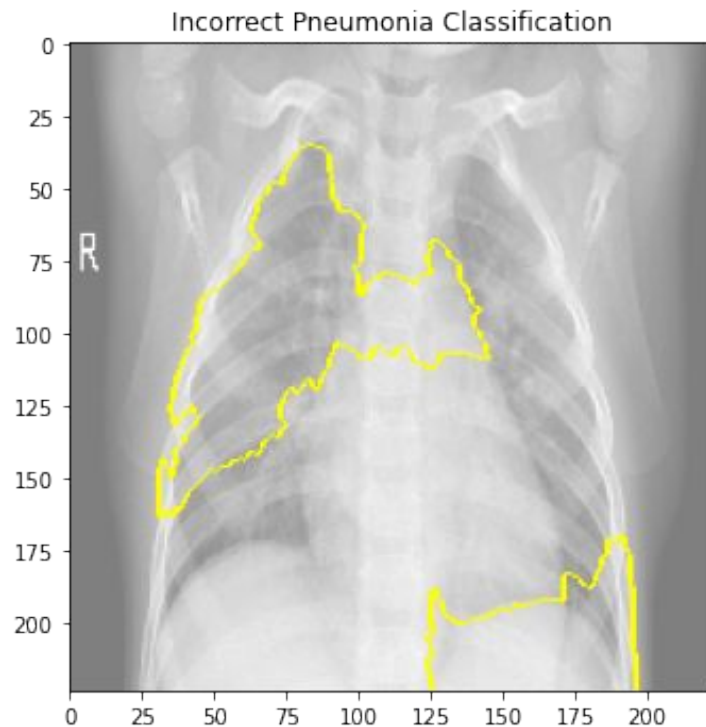
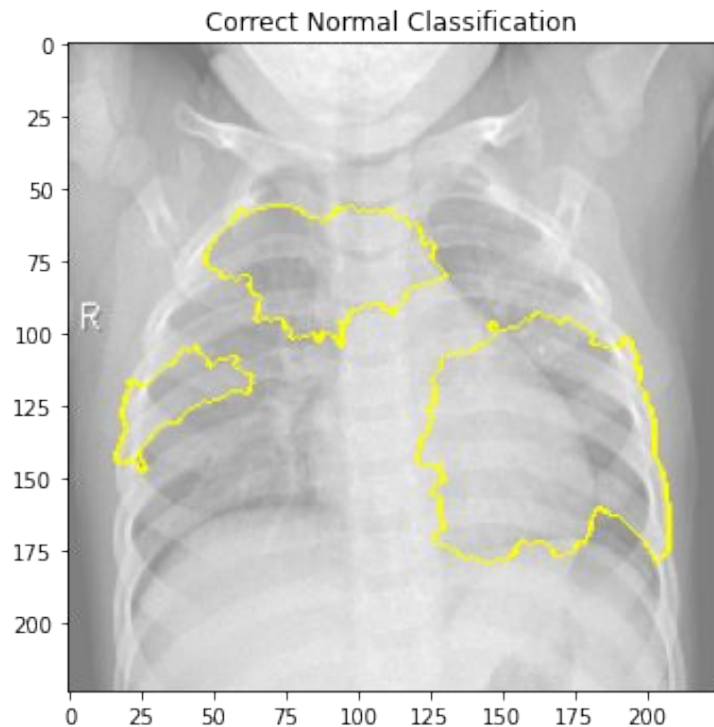Class Imbalance: Training Data

THE RESULTS

Model Confusion Matrix

	Predictions 0	Predictions 1
Actuals 0	377	13
Actuals 1	97	137

*We want to reduce False Negatives, and False Positives

THE RESULTS

Correct Normal Classification   Incorrect Pneumonia Classification
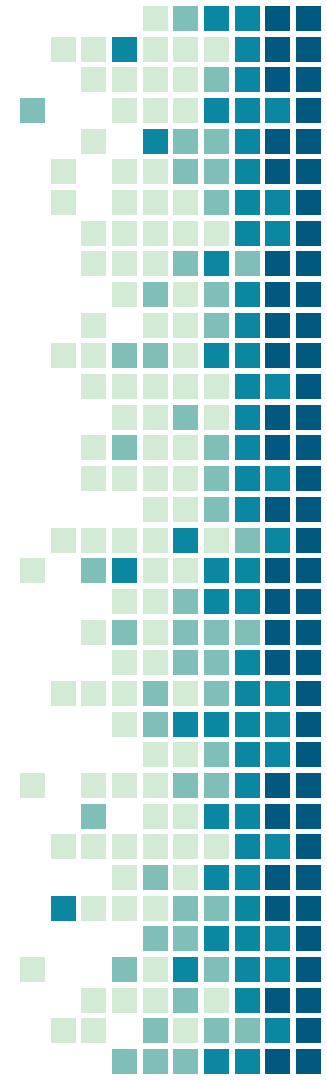
RECOMMENDATIONS

- Use the model as a tool to improve efficiency

Saving time!

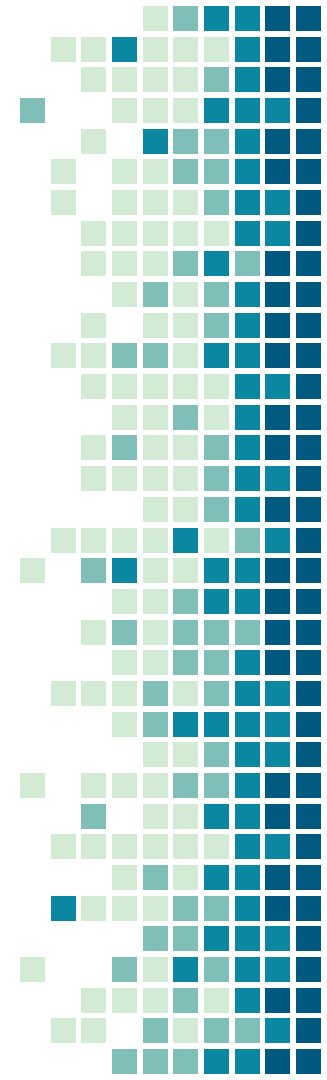| CNN makes prediction | Tech/Doc reviews CNN prediction | Tech/Doc makes final conclusion |

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