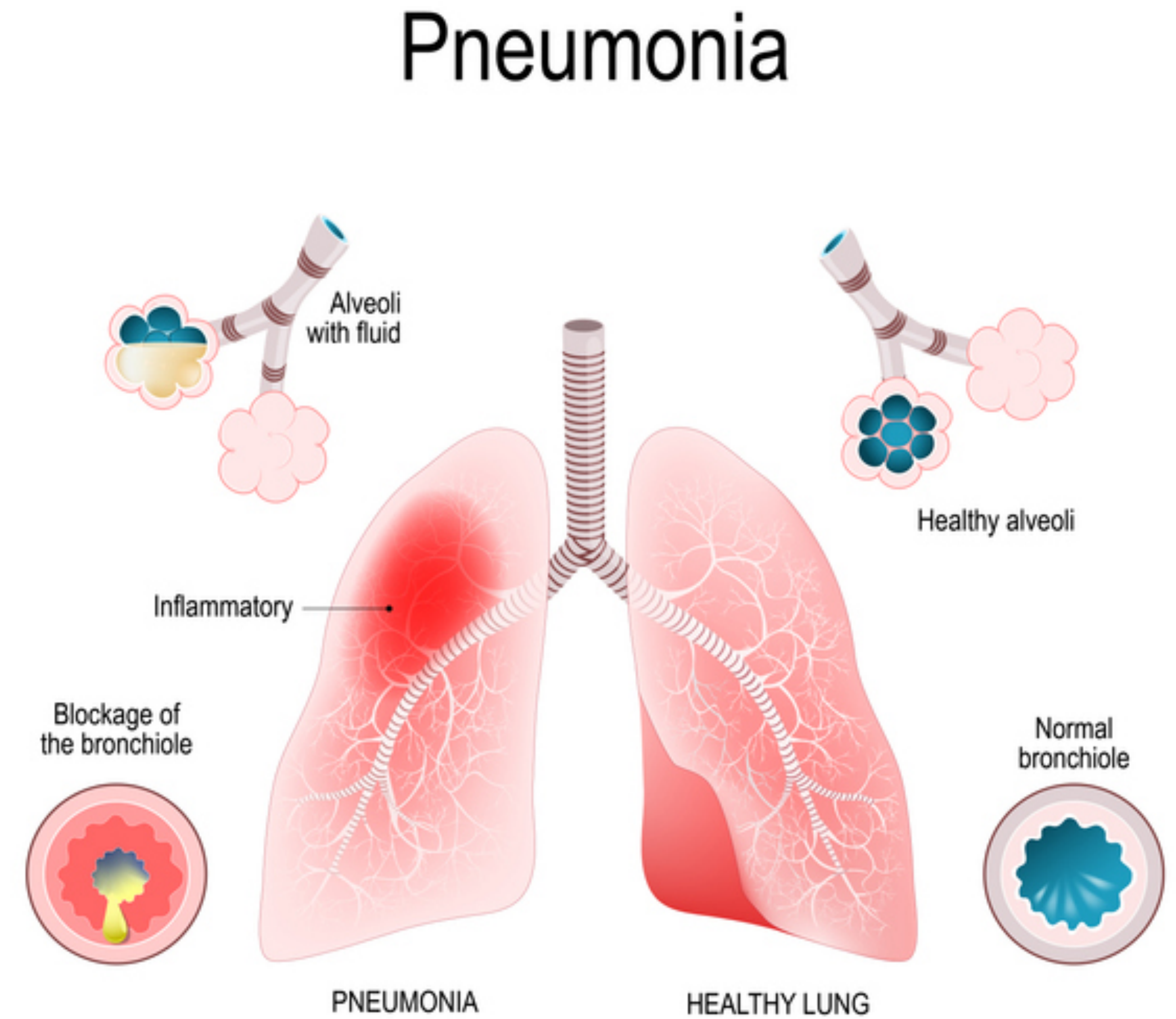# Detecting Pneumonia with Deep Learning and Convolutional Neural Networks

CALEB HARRIS AND YEONJAE ZHANG

Diagnosing Pneumonia
Conventional Diagnosis

- Symptoms of pneumonia begin

- Visit a doctor

- Take x-ray's

- Take blood tests

- Pulse oximetry - measure blood oxygen
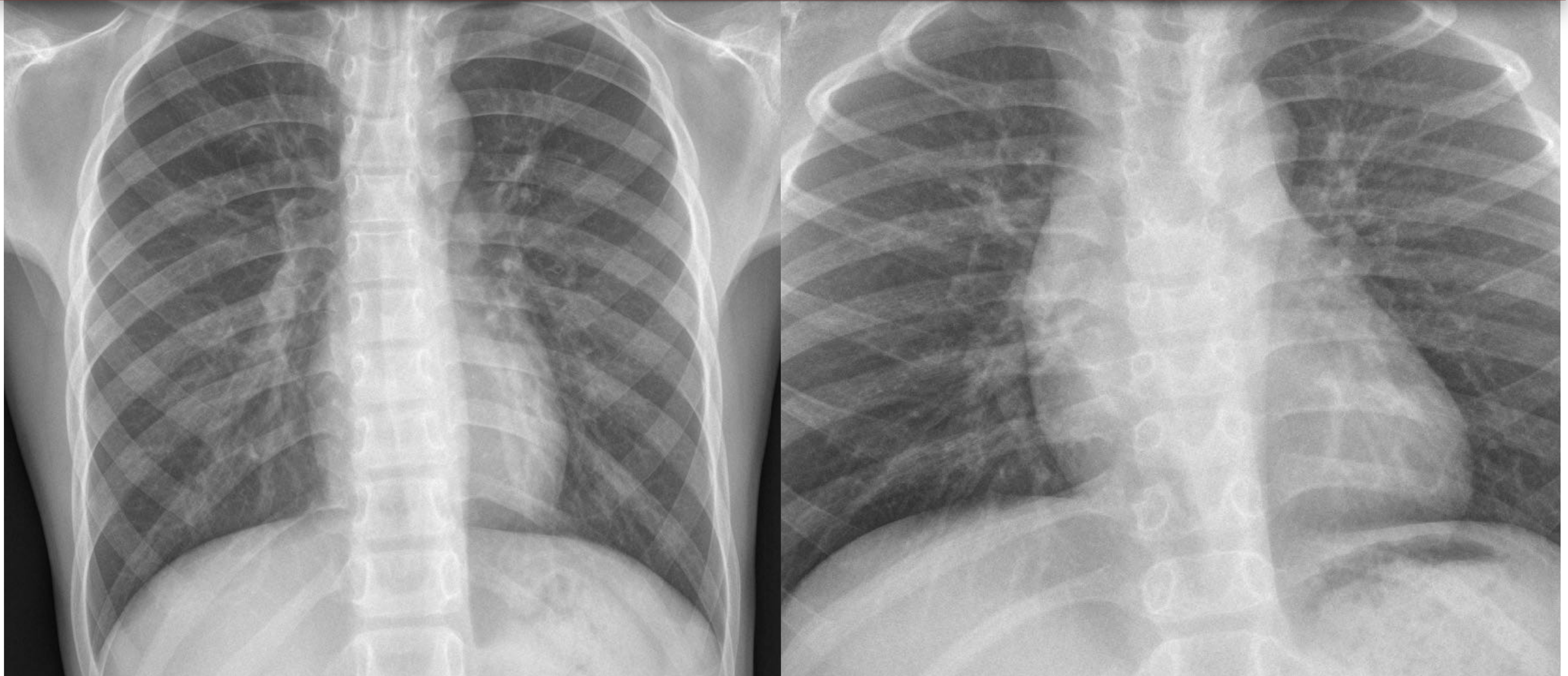 level

Pneumonia

Difficulties Diagnosing Pneumonia

- Shares common symptoms with other conditions

- Tests to diagnose pneumonia are great but they take days for results

- A doctor can misdiagnose pneumonia from an X-ray

  - Failure to notice inflammation

  - Irregular pattern

  - Human error

Which X-ray Shows Pneumonia?

Neither
Both X-ray's are healthy

- Discovering patterns with your naked

  eye is hard

- It's inconsistent

- Unable to confidently replicate

- Conflicting diagnoses may occur

Improving Pneumonia Diagnosis with Machine Learning

DEEP LEARNING AND CONVOLUTIONAL NEURAL NETWORKS CAN IMPROVE ON WHERE DOCTORS FAIL

- Developed to process data from X-ray images and make predictions based on learned patterns

- Ability to:

  - Process thousands of images in seconds

  - Replicate results from any computer anywhere in the world any time

  - Remove human error
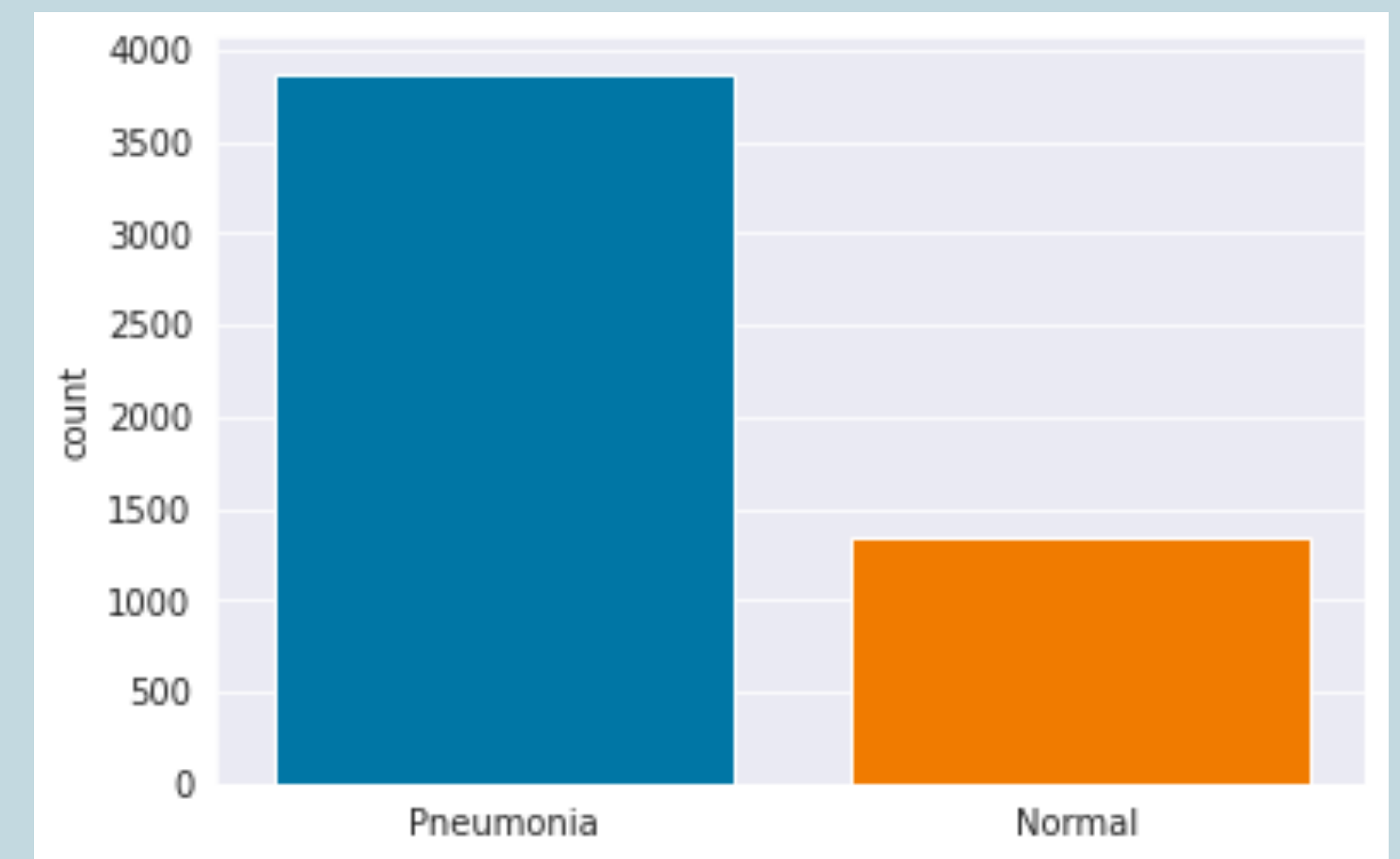
88%

Overall accuracy of our model in detecting pneumonia

Our model is:

- Thousands of times faster at predicting pneumonia than any doctor

- 3% more accurate than a doctor

- More accessible than a doctor

- Provides a mathematic approach to evaluating image data

- Reading an X-ray is closer to getting blood work results with our model

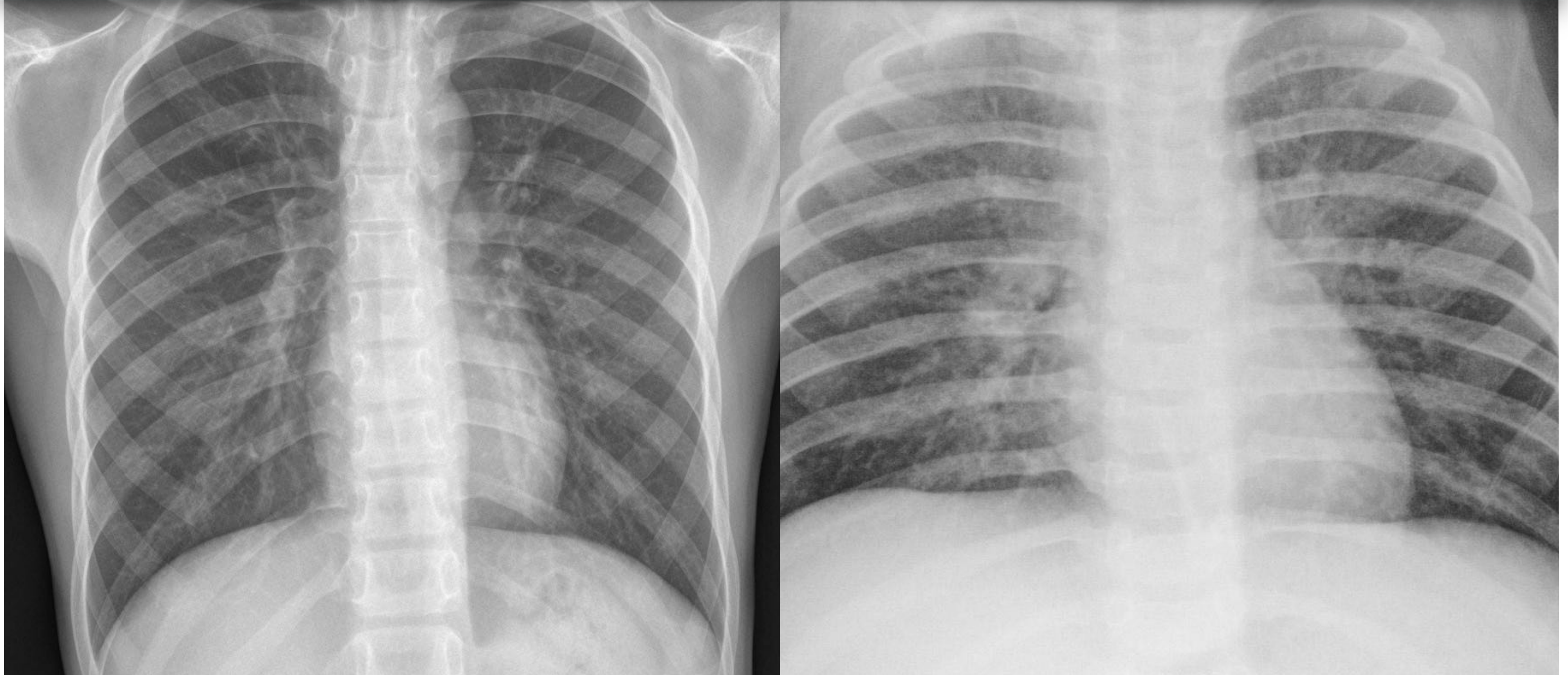# Conclusion and next steps:

- Our model is a helpful tool

- Provides accurate diagnosis in a significantly quicker amount of time

- Our model is not intended to replace the need for doctors in the process of diagnosing pneumonia.

To improve our model:

- More X-ray imagery

- Utilize transfer learning

- Continue to tune our model

Which X-ray Shows Pneumonia?

Thank You!