

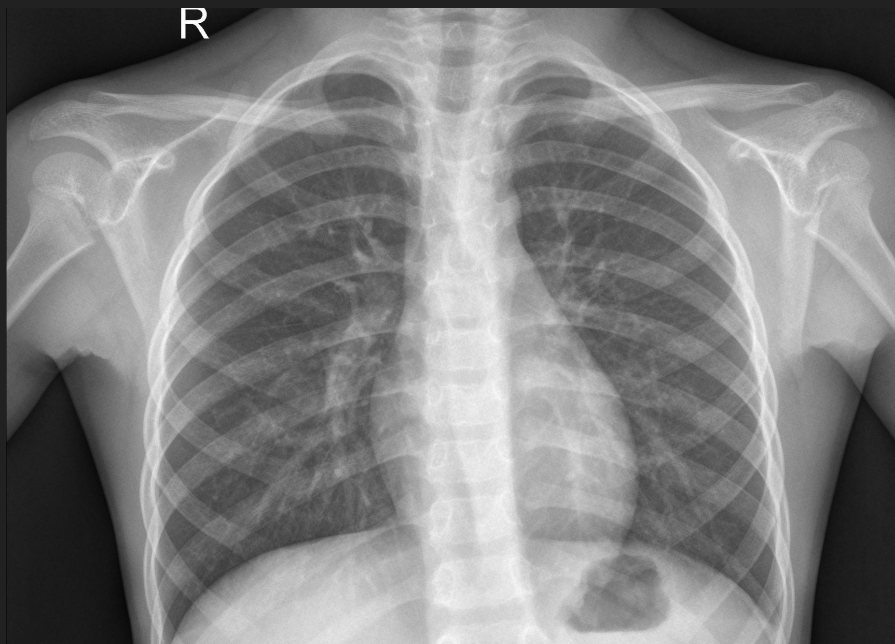
# An X-ray is worth a thousand words



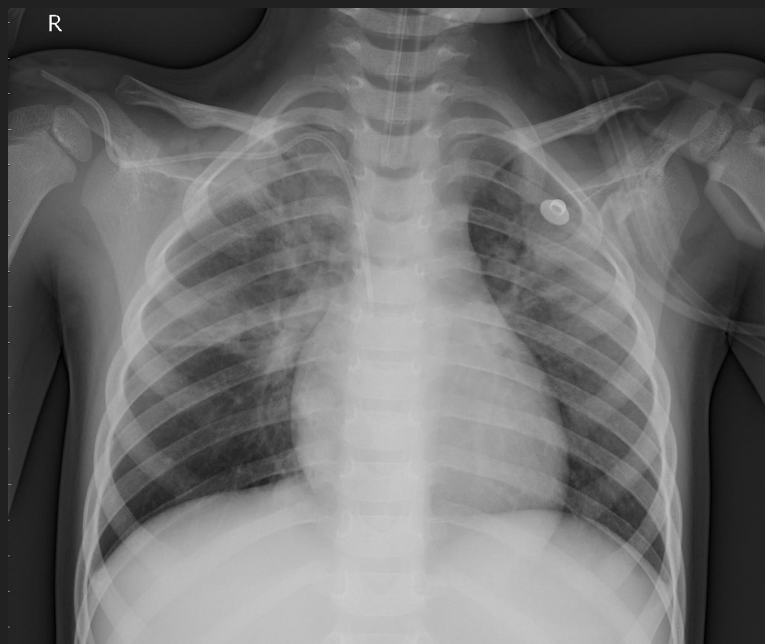
Michael Wang  
James Shaw  
Bobby Williams

# Detecting Pneumonia with X-rays

Normal

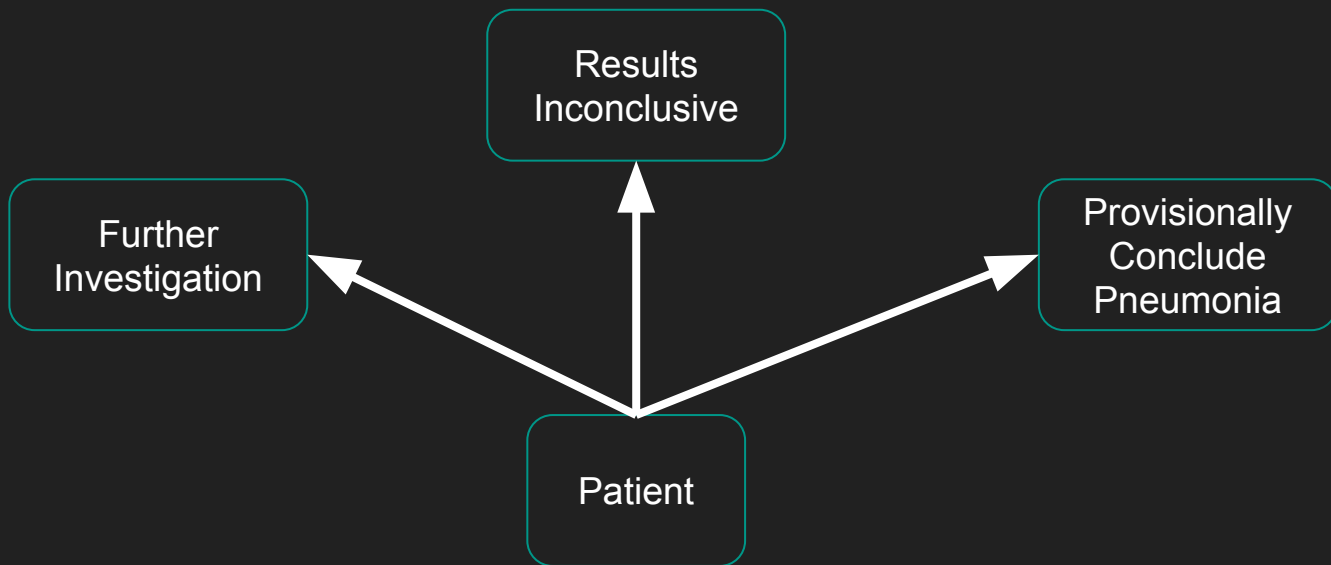


Pneumonia



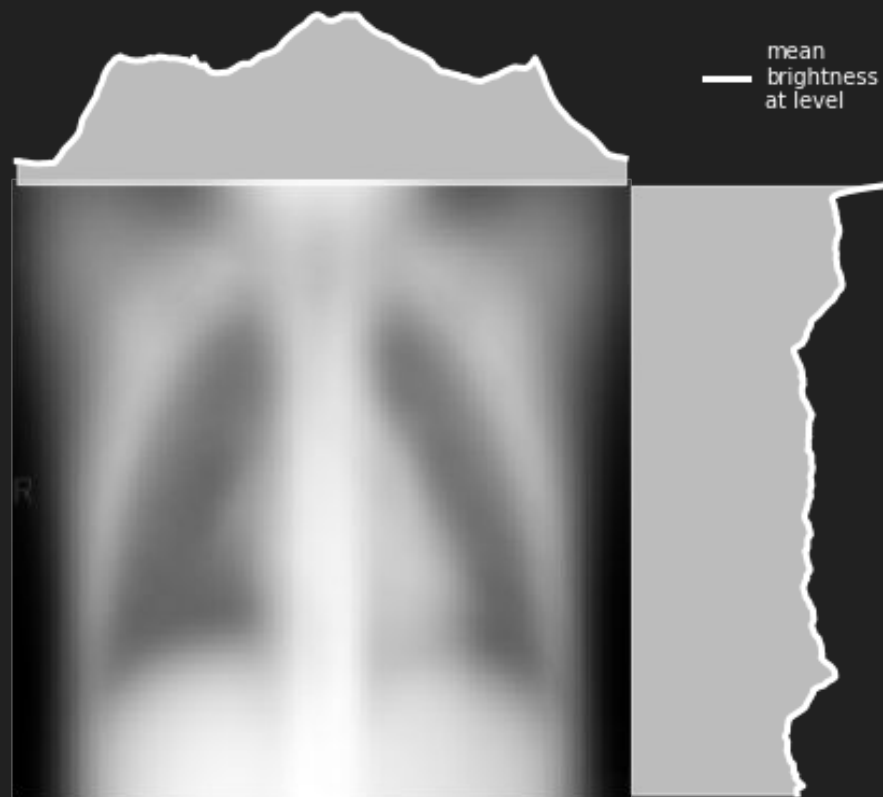
# Goal

Provide an automatic first-pass identification of patient pneumonia status, given a chest x-ray.



# Data

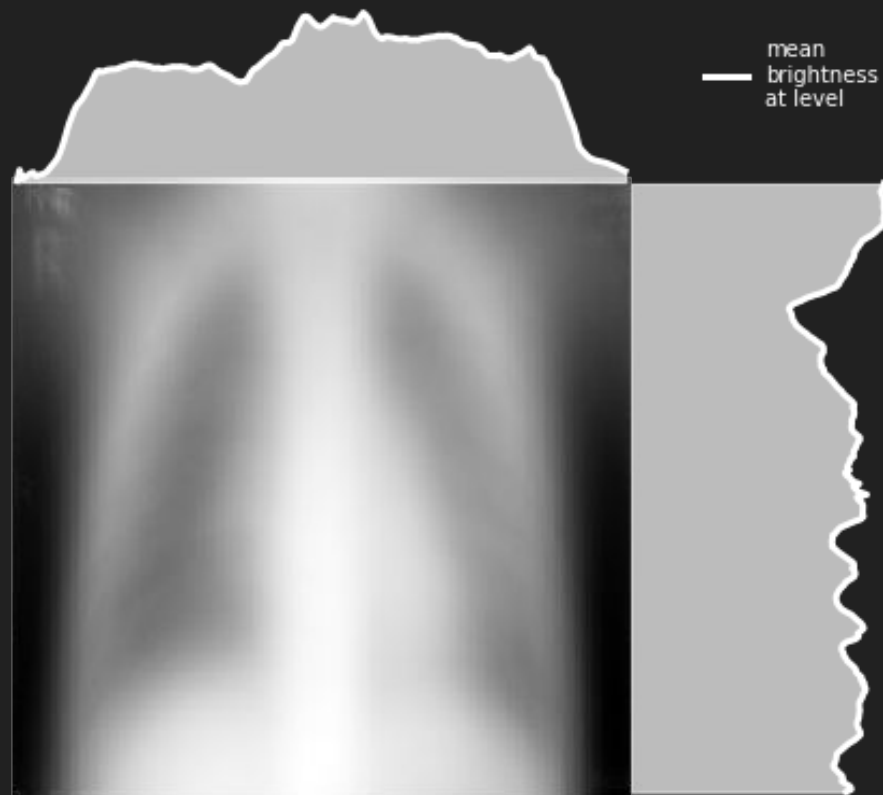
- 5,840 grayscale images
- Chest x-rays of pediatric patients **with suspected pneumonia**
- Categorized into “normal”/“pneumonia”



Composite normal X-Ray

# Data

- 5,840 grayscale images
- Chest x-rays of pediatric patients **with suspected pneumonia**
- Categorized into “normal”/“pneumonia”



Composite pneumonia X-Ray

# Convolutional Neural Network

Model looks at x-ray images of patients with/without pneumonia to learn what to look for.



# Predictions

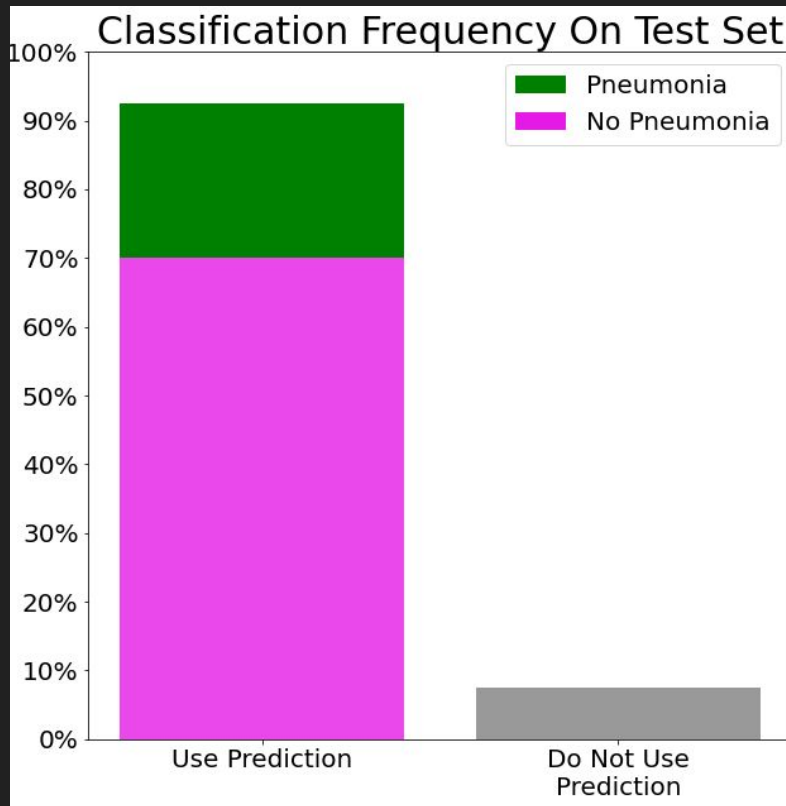
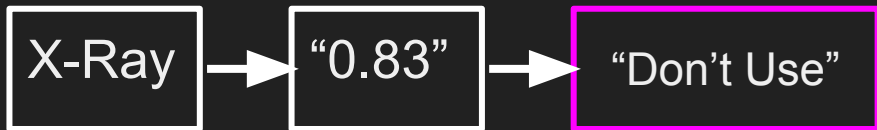
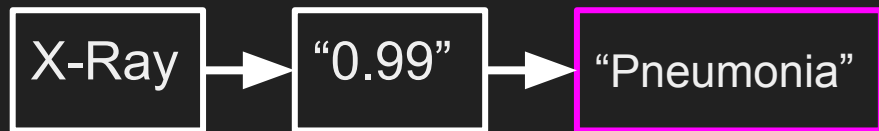
Take In Picture

Assign x-ray images to:

“Likely Pneumonia”

“Likely Not Pneumonia”

Also give confidence score



# Performance

Of 253 patients we:

- Correctly catch 180 with pneumonia
- Correctly clear 67 pneumonia-free patients
- Miscategorize 4



# Recommendations/Next Steps

- Utilize as a first-pass measure in low-resource areas
- Investigate other models & transfer learning
- Real-world field testing with oversight
- Expand training data
- Conduct surveys of diagnostic availability across regions

# Limitations

- Access only to processed images
- Finite processing power forced some network design choices
- Images are of a specific age group

# Contact Information

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Bobby Williams - <https://github.com/bobbyiestofjos>