



Pneumonia Analysis

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Agenda



1. ADDRESS
STAKEHOLDER



2. DATA
BACKGROUND



3. PREDICTIVE MODEL



4. CONCLUSION/
RECOMMENDATIONS



5. NEXT STEPS

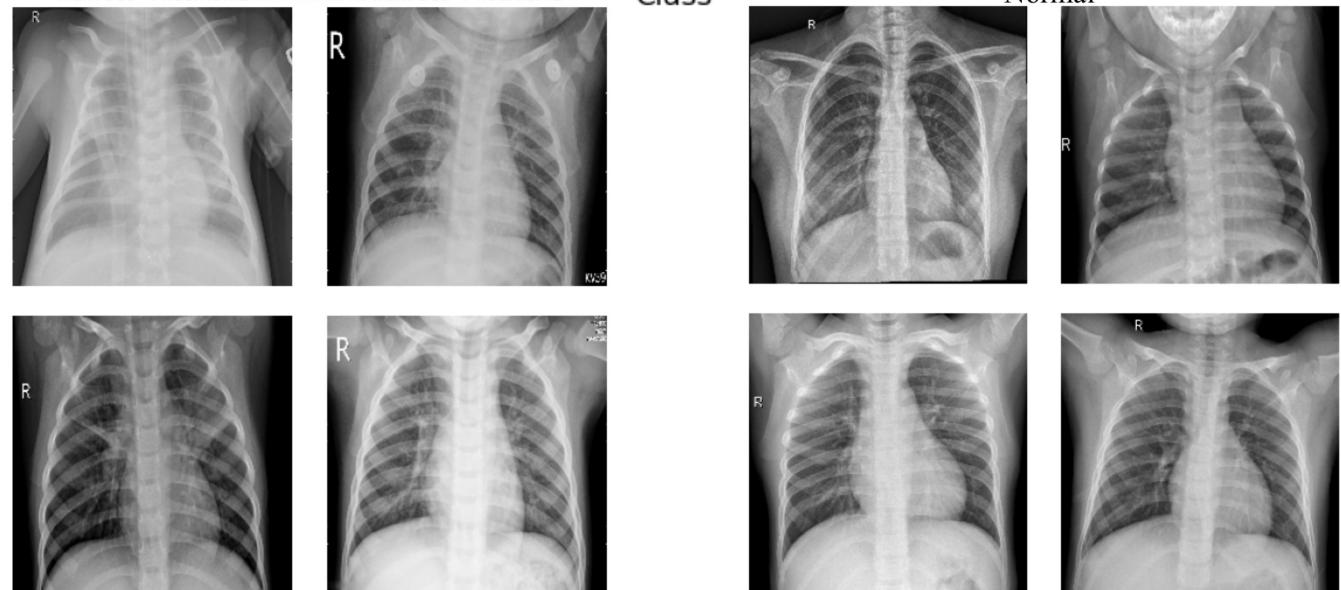
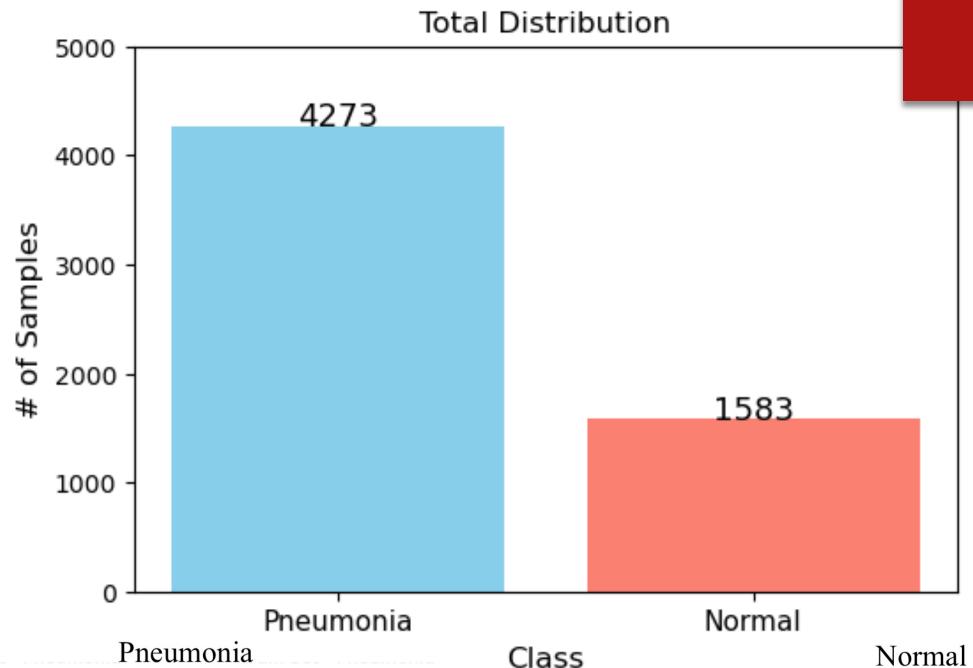
Business Question

Viral and Bacterial Pneumonia in
Southeast Asia and Africa

Don't have time, money, and volunteers
to check all the xrays

Data Understanding

- ▶ 6,000 x-rays of 1-5 year old children in Guangzhou, China
- ▶ X-rays taken in 2017
- ▶ All X-rays were reviewed separately by 3 professionals

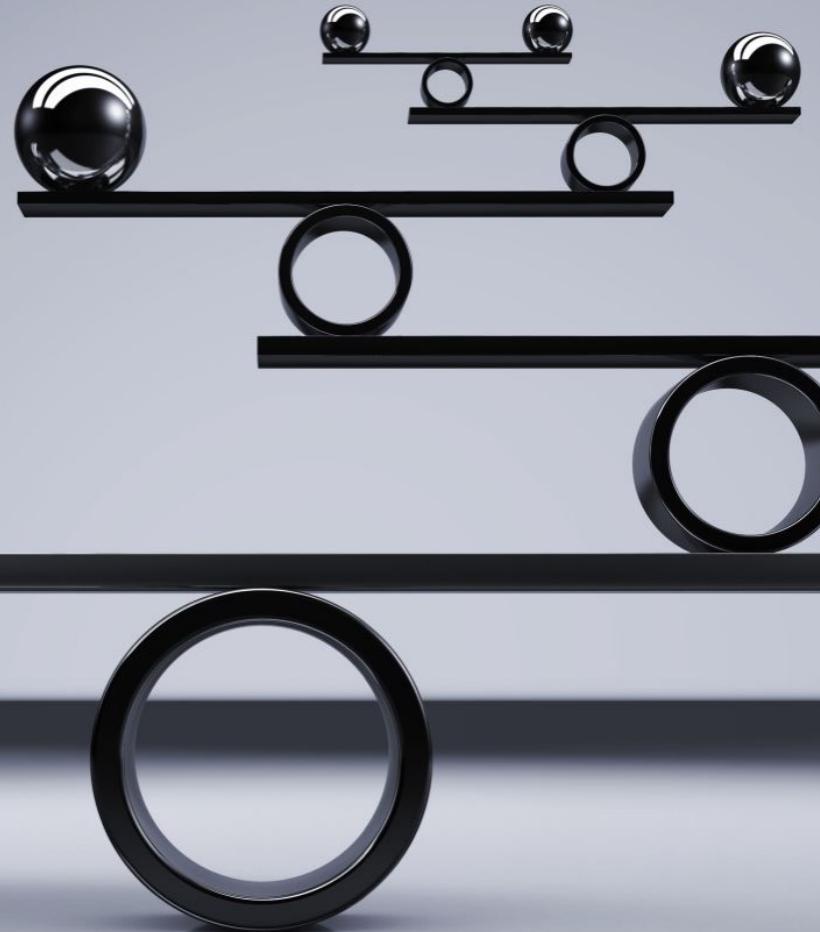




Modeling

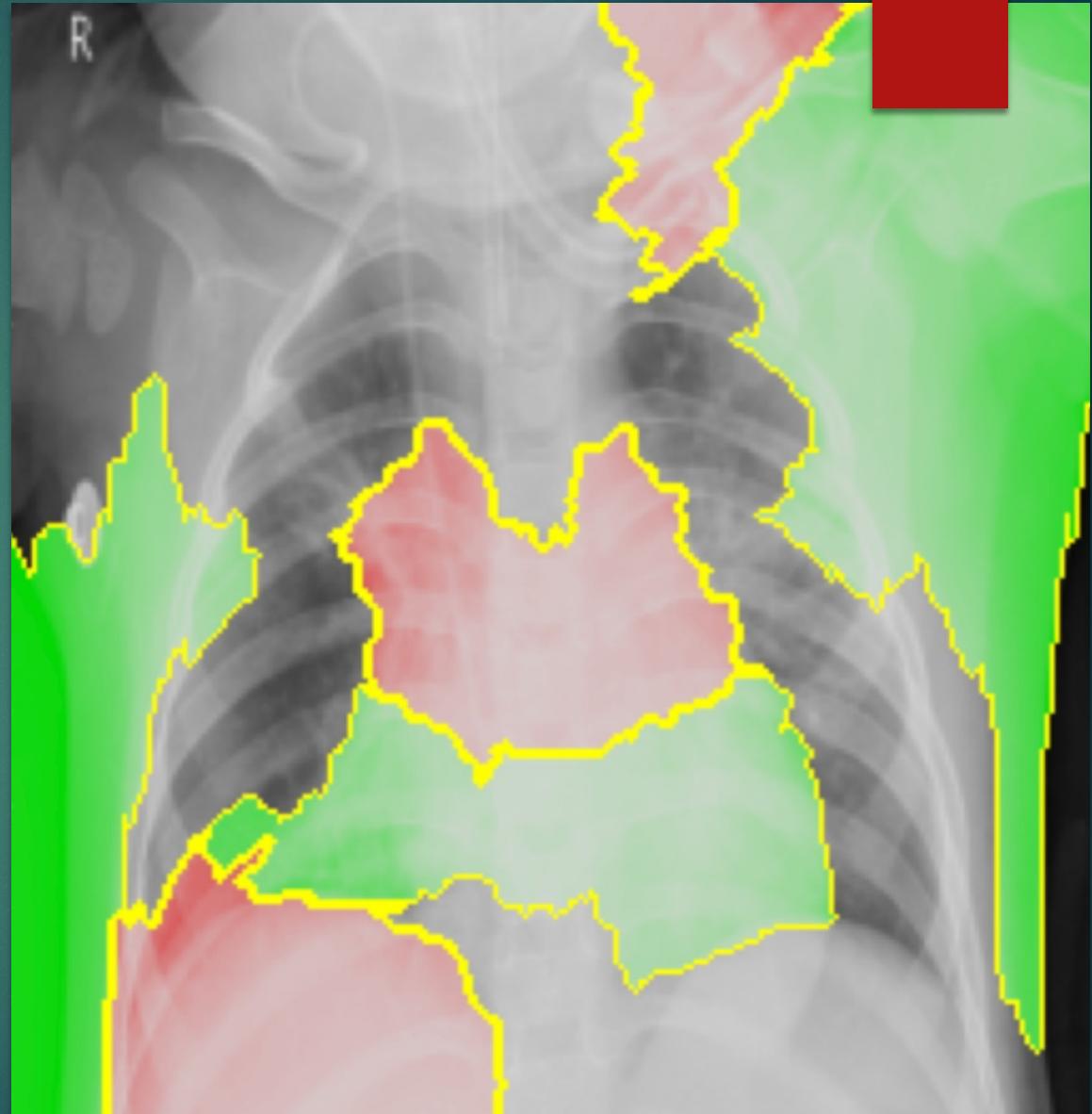
Precision vs Recall

- ▶ False Positive- brief scare as patient thinks they have Pneumonia
 - ▶ Precision
- ▶ False Negative- cause pneumonia patient to remain untreated
 - ▶ Recall



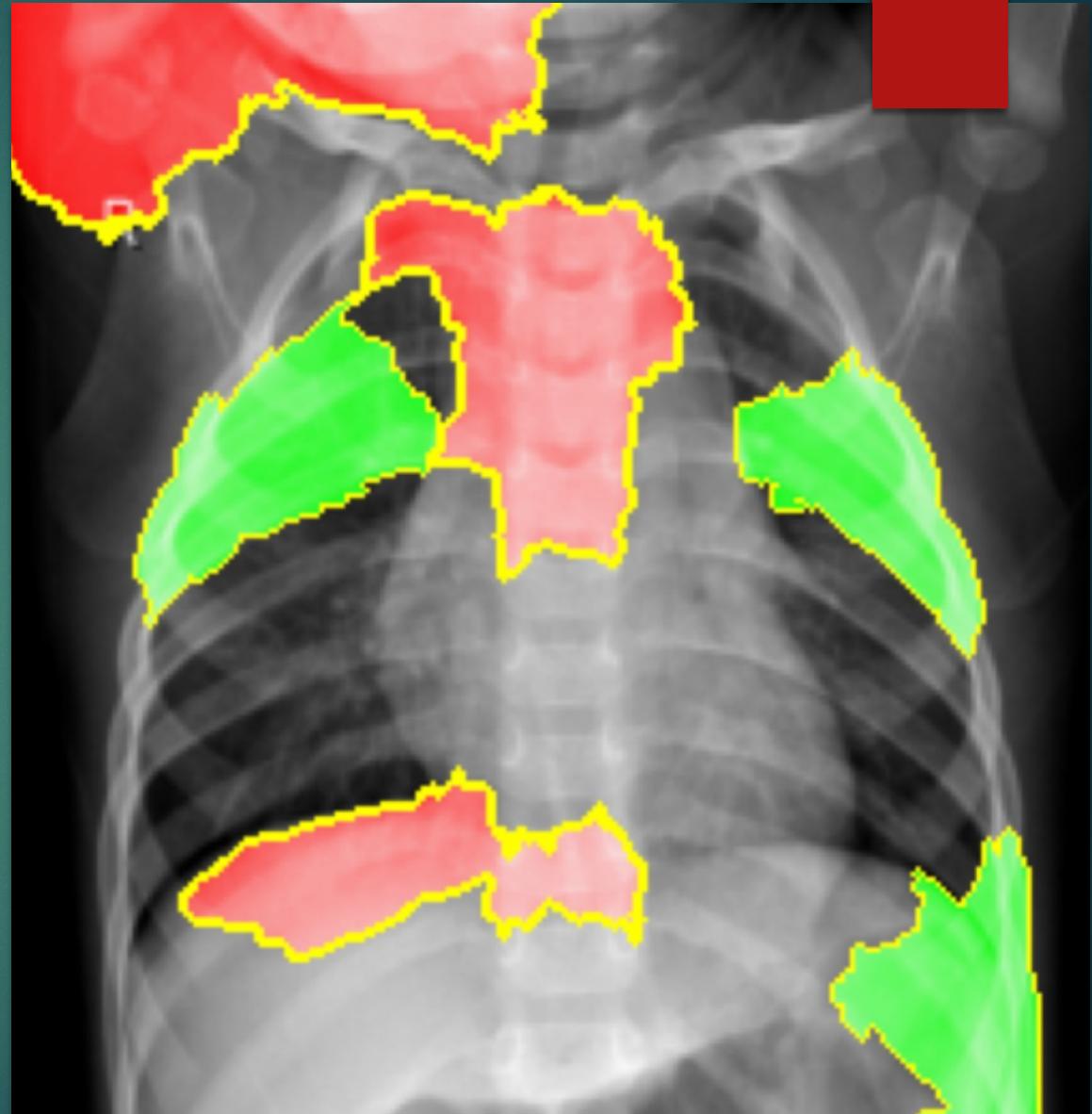
Model Evaluation

- ▶ 99.47% certain patient has Pneumonia
- ▶ Green factors: increases chance of Pneumonia
- ▶ Red factors: decreases chance of Pneumonia



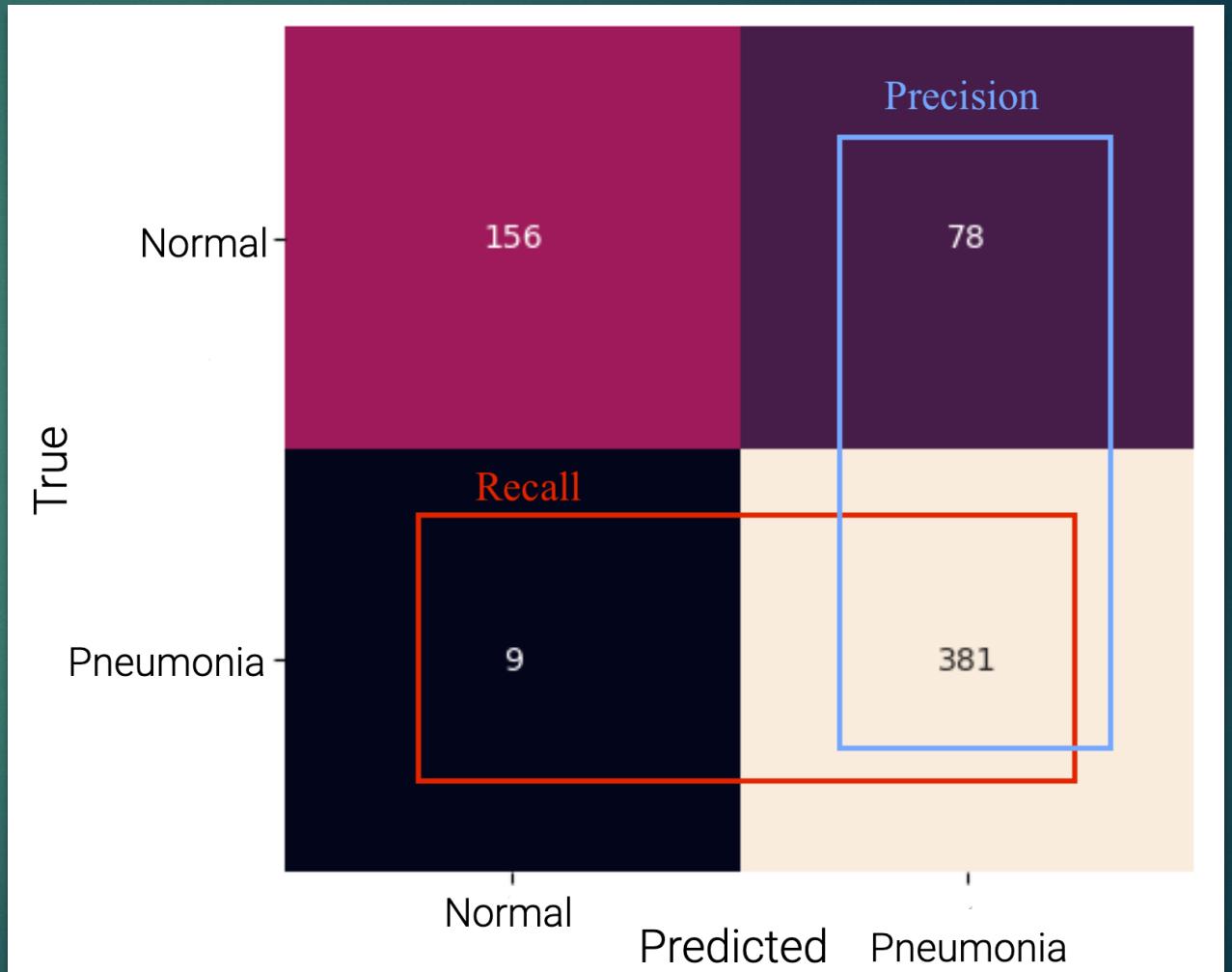
Model Evaluation

- ▶ .1% certain patient has Pneumonia
- ▶ Green factors: increases chance of Pneumonia
- ▶ Red factors: decreases chance of Pneumonia



Model Metrics

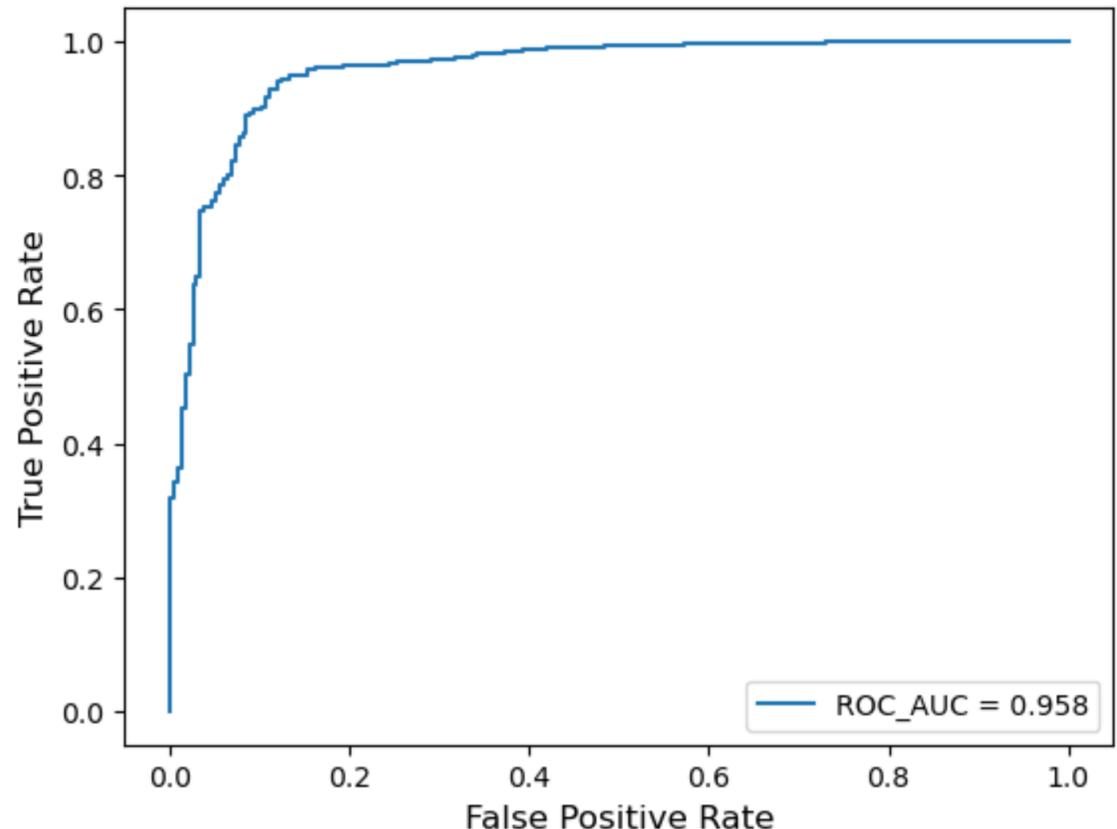
- ▶ Tested on 624 unseen x-rays
 - ▶ Accuracy: 86%
 - ▶ Precision: 83%
 - ▶ Recall: 98%
 - ▶ F1-score: .90



Model Metrics

- ▶ Loss: .35
 - ▶ Measure difference between true and predicted
- ▶ ROC score of .96

ROC Curve



Recommendations



Thoroughly
examine positive
tests



Briefly confirm the
negative tests



Next Steps

- ▶ Analyze treatment methods
- ▶ Predict within the Pneumonia set
 - ▶ Viral, bacterial or Healthy

Thank you

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