Diagnostic Imaging

Pneumonia Classification

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Background

- Radiologists “officially” analyze imaging of ER patients

- Ordering physician usually interprets it 1st
  - earlier treatment of sick patients

    versus

  - inappropriate care delay

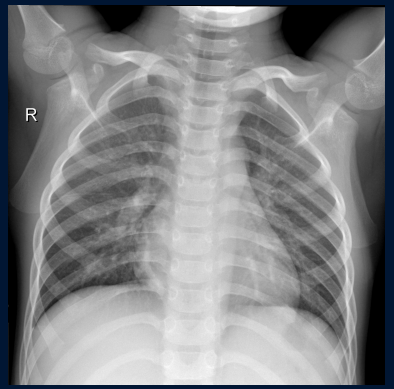
Business Problem

- Cyclops Hospital Network (CHN) is seeking a **Decision Support Tool** (DST)
    - decrease care delay
    - decrease discharge of sick patients

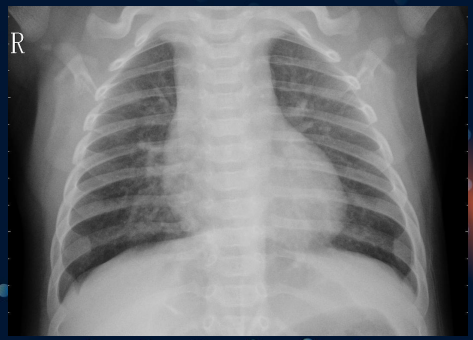
Data Understanding

- 5,323 chest x-rays from children
  - Pneumonia versus Healthy

- Images of various sizes
  - Standardized image sizes



Normal X-Ray



Pneumonia X-Ray

Data Understanding

- False positive:
  - normal x-ray → DST → pneumonia x-ray

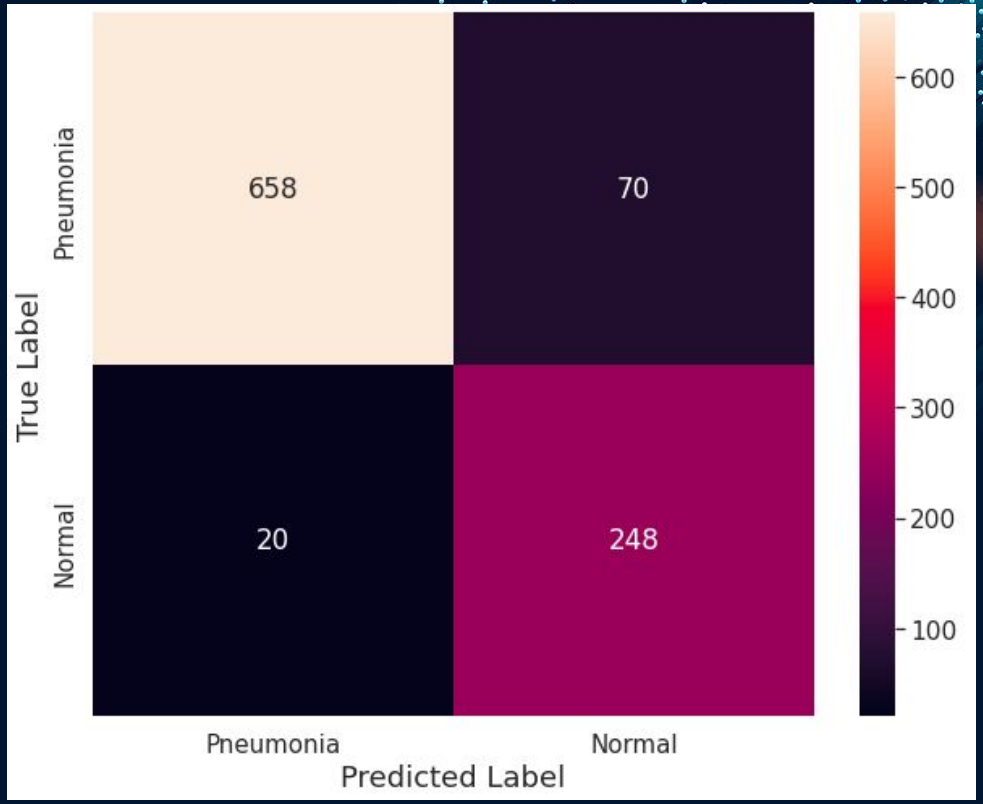
- False negative:
  - pneumonia x-ray → DST → normal x-ray

Modeling

- Convolutional Neural Network
- Pattern recognition → differentiation between x-rays (pneumonia vs. no-pneumonia)

Final Model

- Testing Accuracy
  - **88%**



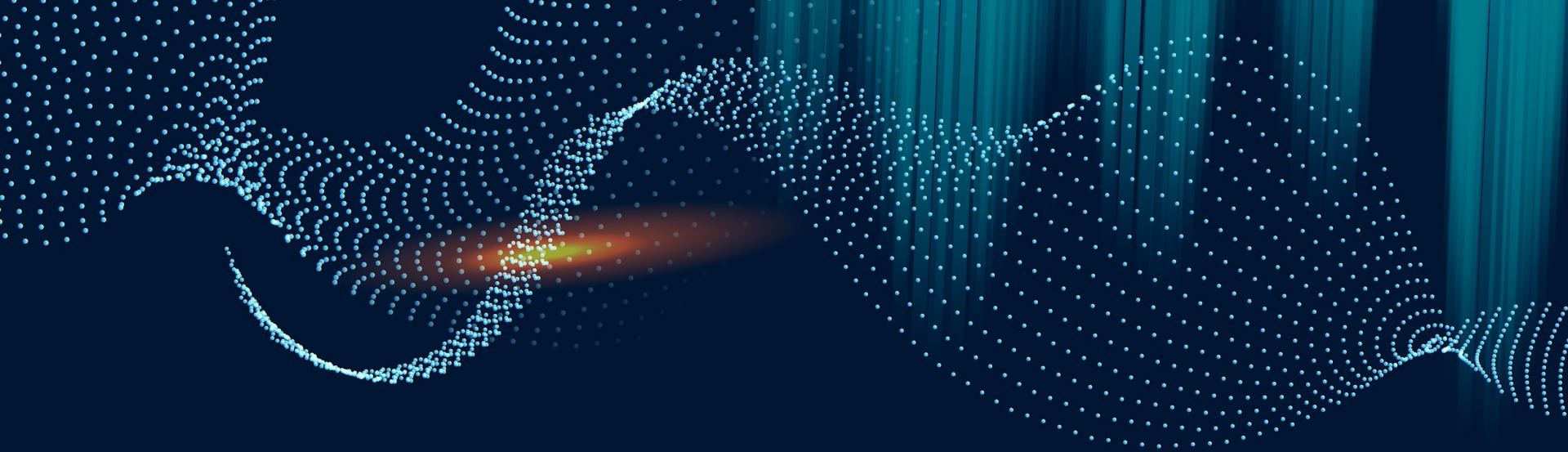
Conclusions

Our model accurately labels an x-ray from a patient with or without pneumonia **88**% of the time.

Next Steps

Study of **Decision Support Tool** (DST) efficacy:

- Implement usage of DST within Cyclops Hospital Network
- Calculation of “case save rate”
- Estimation of monetary savings due to decrease in care delay and lawsuits



Thank You

Questions

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