Pediatric Pneumonia Identification Using Deep Learning

By Adam Pell

Outline

- Overview
- Data Understanding
- Methodology
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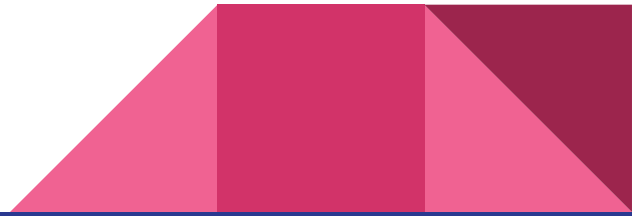
- Conclusion



Overview

When diagnosing serious illness, time is of the essence. This project uses deep learning techniques to help physicians quickly detect pneumonia in chest X-rays.

Key Takeaway: Low false positive/false negative rate, quick prediction

Recommendation: Second opinion for suspected illness

Data Understanding

Pediatric chest X-Rays from hospital in Guangzhou, China:

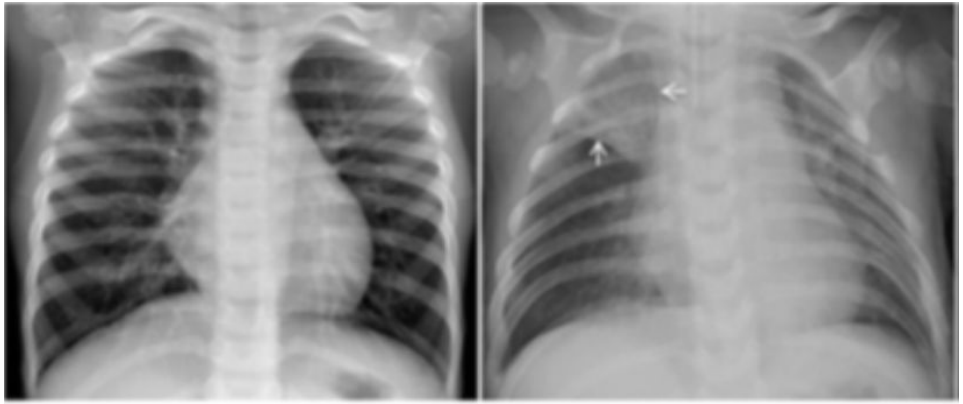
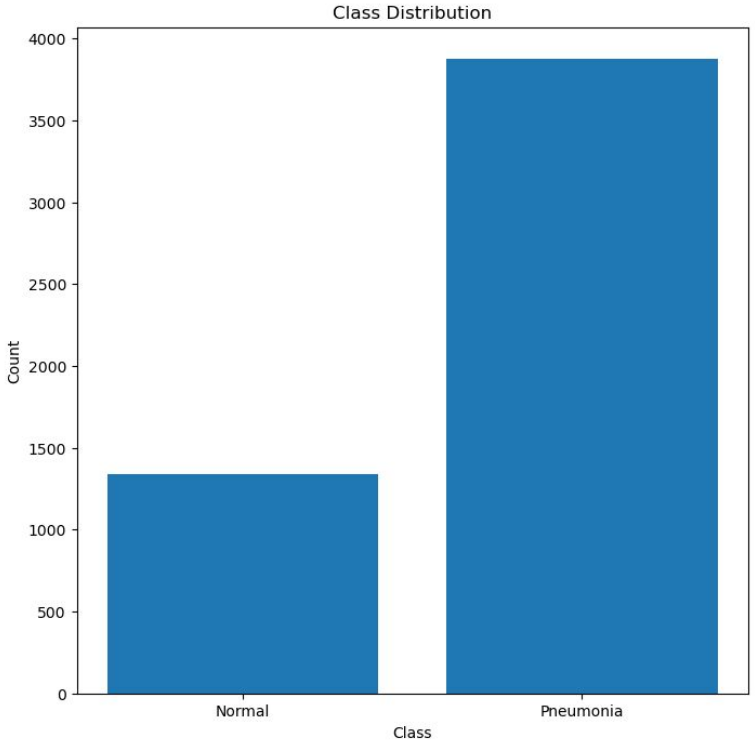


Image Credit: Cell.com

Methodology

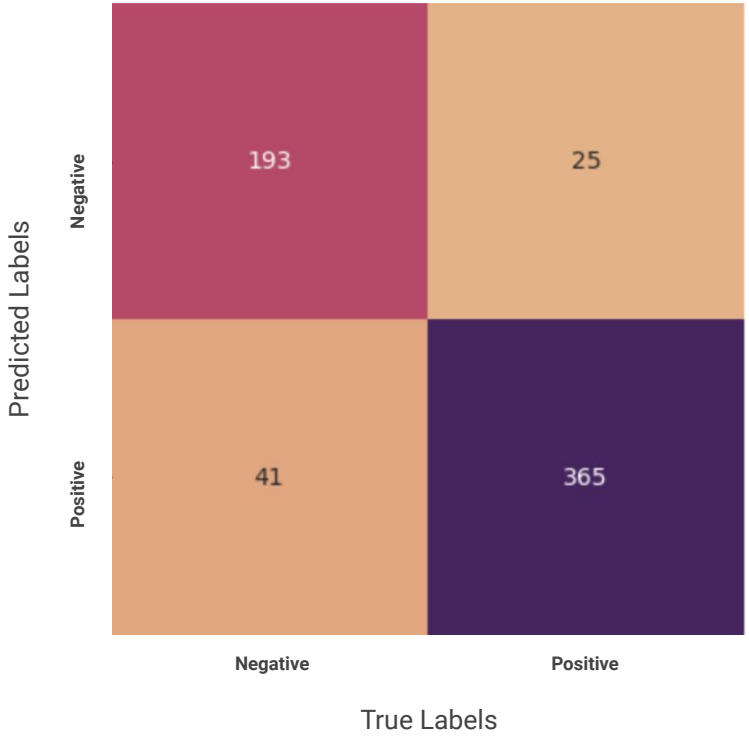
- Deep learning
- Iterative modeling
- Transfer learning
- **Target: Recall**
  - High true pos./low false neg.



Final Model Key Trends

Final Model Results

- Negative Case (no illness)
  - 18% error
- Positive Case (illness)
  - 6% error



Conclusions

Second Opinion for
Suspected Illness

Low false positive rate

Reduce costly communication time

False negative rate too high for clinical use

Next Steps

- More data
- More complex models
- Image augmentation
- Explainability

Thank You!!

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- **Sources**
  - Identifying Medical Diagnoses and Treatable Diseases by Image-Based Deep Learning