

Pediatric Pneumonia Identification Using Deep Learning

By Adam Pell

Outline

- Overview
- Data Understanding
- Methodology
- Results
- 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:

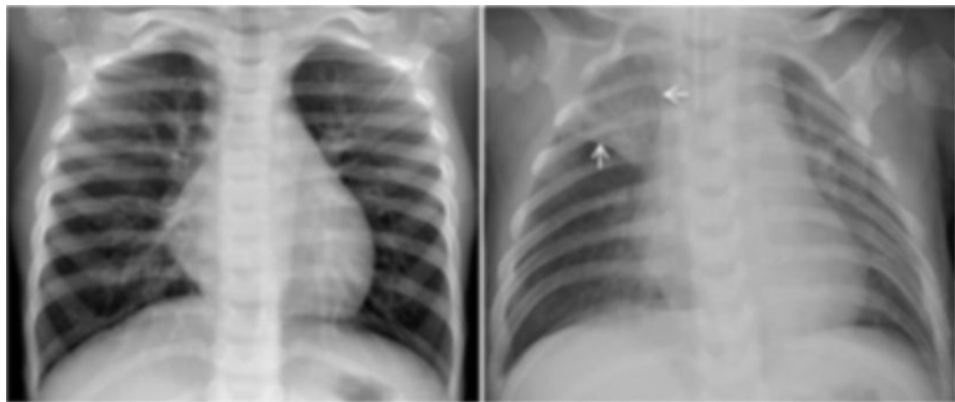
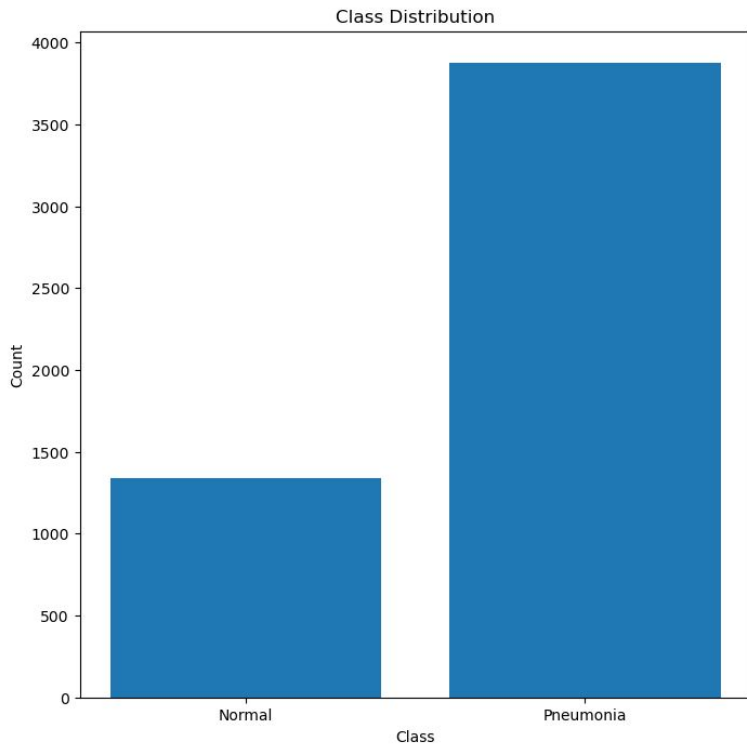


Image Credit: [Cell.com](https://www.cell.com)

Methodology

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



Final Model Key Trends



The image features three stylized, house-shaped blocks arranged horizontally. Each block has a white outline and a flat top. The first block is light pink and contains the text 'Optimized Performance'. The second block is a medium pink and contains the text 'Low False Positives'. The third block is a dark maroon and contains the text 'Short Training Time'. Below these three blocks, there is a decorative horizontal bar composed of three segments in the same color scheme (light pink, medium pink, and dark maroon) that tapers to a point on the right side. The entire graphic is set against a white background with a dark blue footer bar at the bottom.

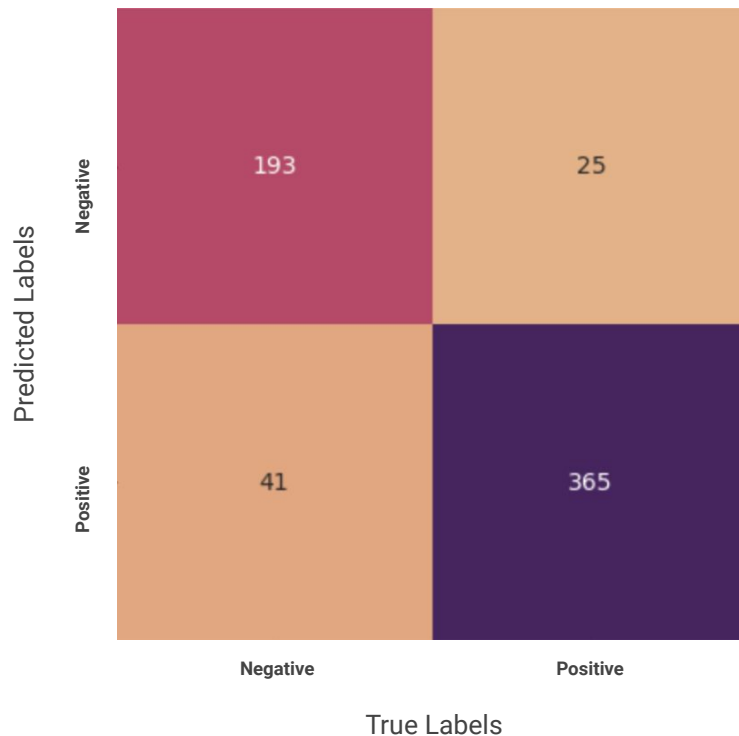
**Optimized
Performance**

**Low False
Positives**

**Short
Training Time**

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!!

- **Email:** apell7591@gmail.com
- **Github:** [@apell74](#)
- **LinkedIn:** [Adam Pell](#)
- **Sources**
 - [Identifying Medical Diagnoses and Treatable Diseases by Image-Based Deep Learning](#)

