

X-Ray Image Classification

Identifying Pneumonia from Chest X-Rays

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Agenda

1. Objective & Approach
2. The Data
3. Data Exploration
4. Modeling
5. Performance
6. Limitations and Next Steps
7. Conclusion

Objective & Approach

Goal

- Identify pneumonia

Methodology:

- Analyze database of chest x-rays
- Create models (neural networks)
- Optimize models based on performance metrics

The Data

Source

- “Large Dataset of ... Chest X-Ray Images” from Mendeley Data

Key Attributes

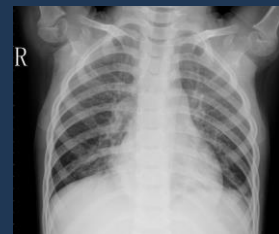
- Over 5,800 images
- Labeled as “normal” or “pneumonia”

Data Exploration: Example Images

Normal

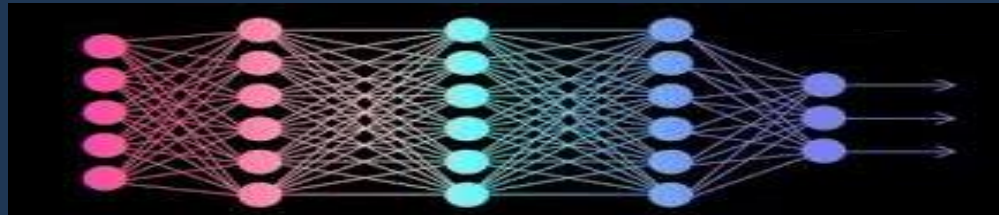


Pneumonia



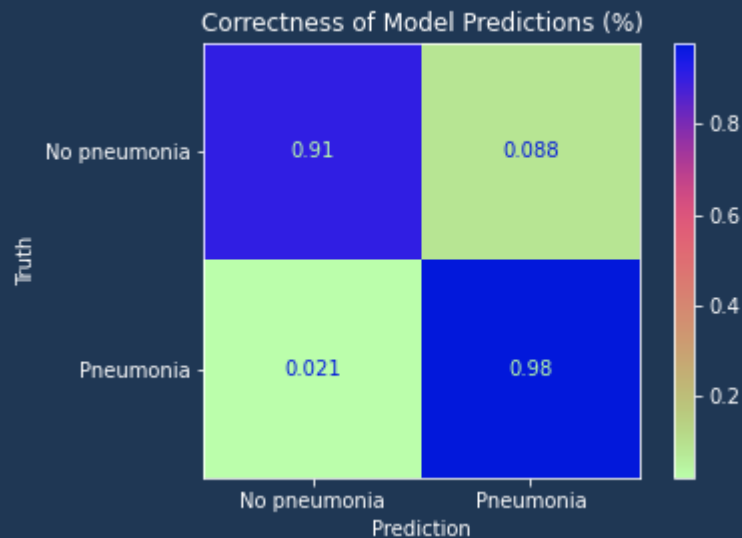
Modeling

- Dozens of neural network models tested
- “Black box” models make identifying the “why” behind a classification hard
- Overall 96% accuracy



Performance

- Correctly classifies 96% of images
- “Misses” case of pneumonia only 1 in 47 times
- Most mistakes are false positives (preferable)



Limitations & Next Steps

Limitations

- Black box model
- X-rays provided by only one study (limited scope)

Next Steps

- Add image processing step to identify region in image that shows pneumonia

Contact Information

