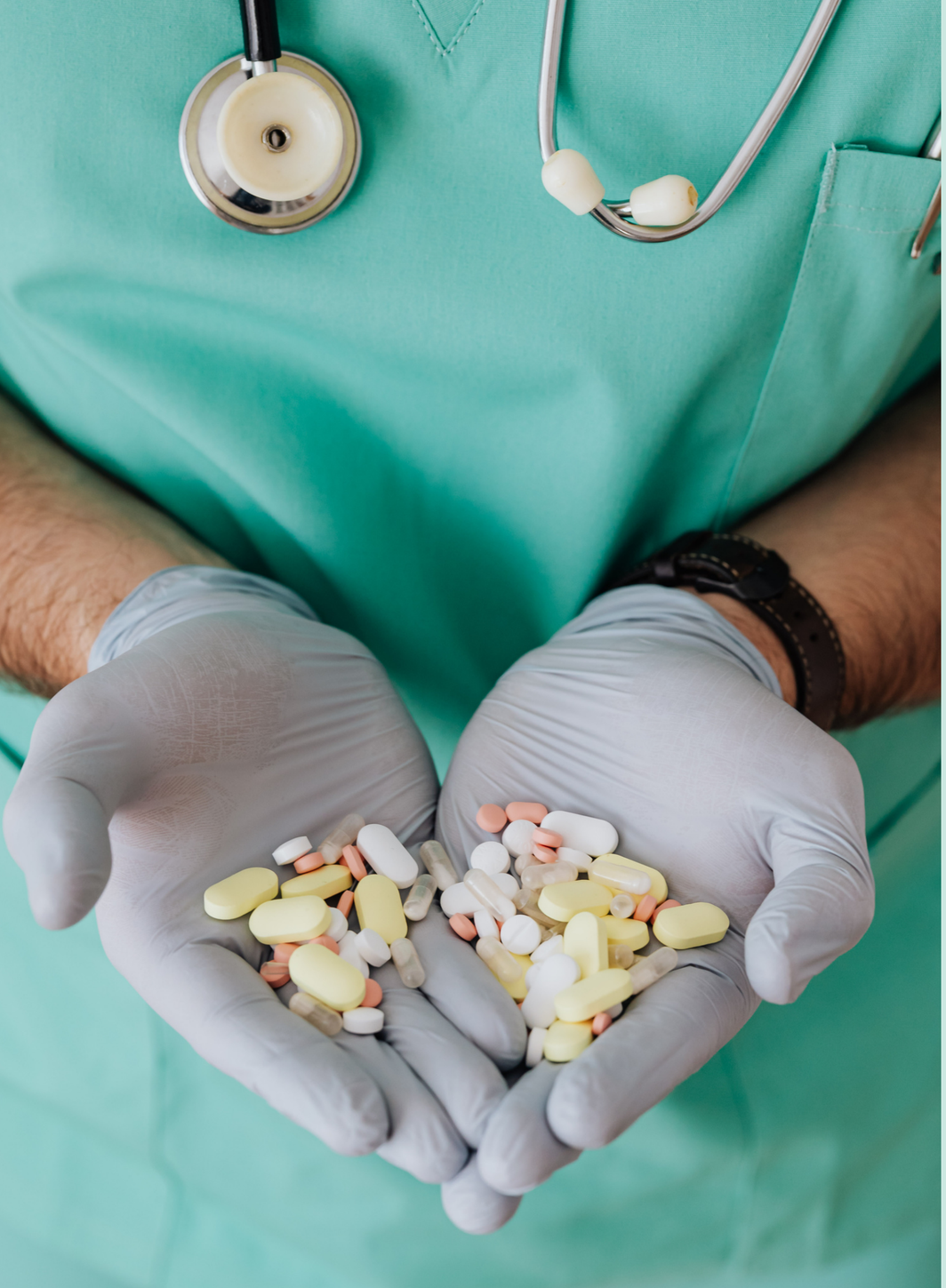


Neural Networks for Medicine

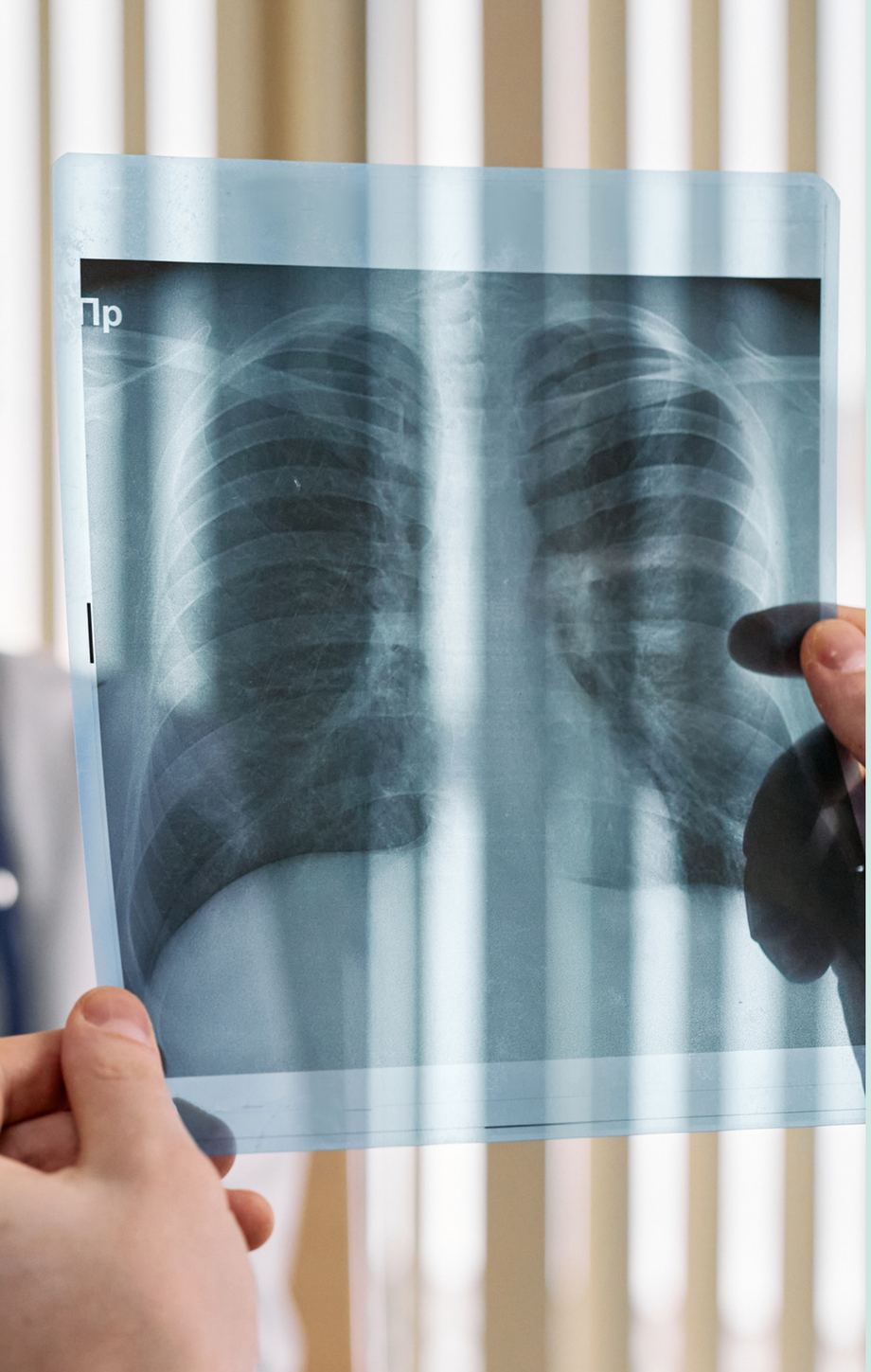
Pneumonia Image Classification - Neural Network Analysis

Presented by
Clara Giurgiu
&
Vladimir Sekiguchi

Presentation Outline

Today's Topics

- Business Problem
- Data
- Model Methods
- Results
- Conclusion
- Next Steps



Business Problem

A brighter future for children

- **Pneumonia -** Leading cause of mortality in children
- Can we predict whether an x-ray image shows pneumonia or not?

Data ⟶

This project uses the x-ray images provided by the University of California San Diego and Guangzhou Women and Children's Medical Center. A total of 5,855 x-rays of pediatric patients.

Model Methods

● ○ ○ Dummy Model

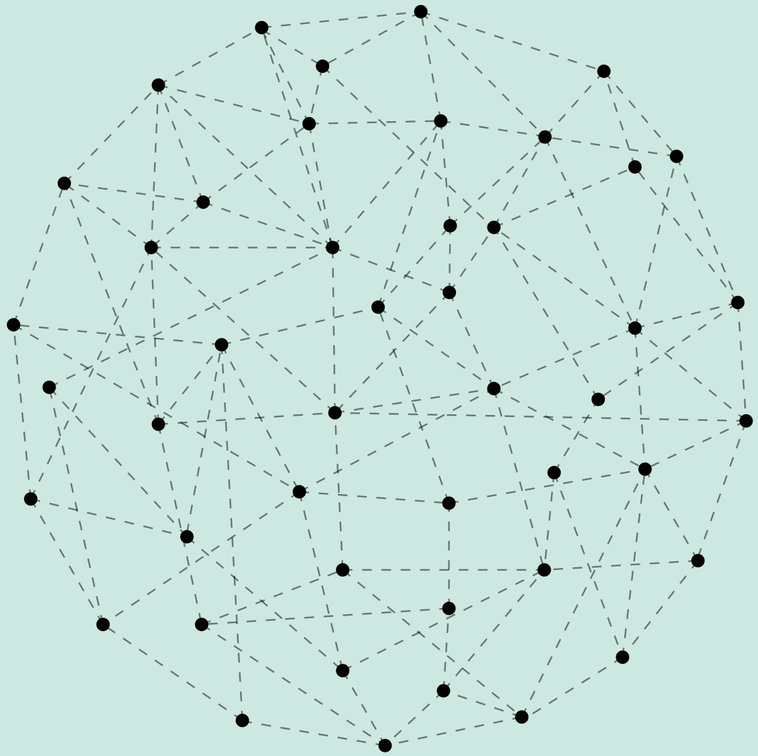
Simply picks positive and negative cases 50/50. Giving us a baseline of 50% scores across the board.

● ● ○ Densely Connected Neural Network

Allows us to specify a neural network, precisely, sequential: from input to output, passing through a series of neural layers, one after the other.

● ● ● Convolutional Neural Network

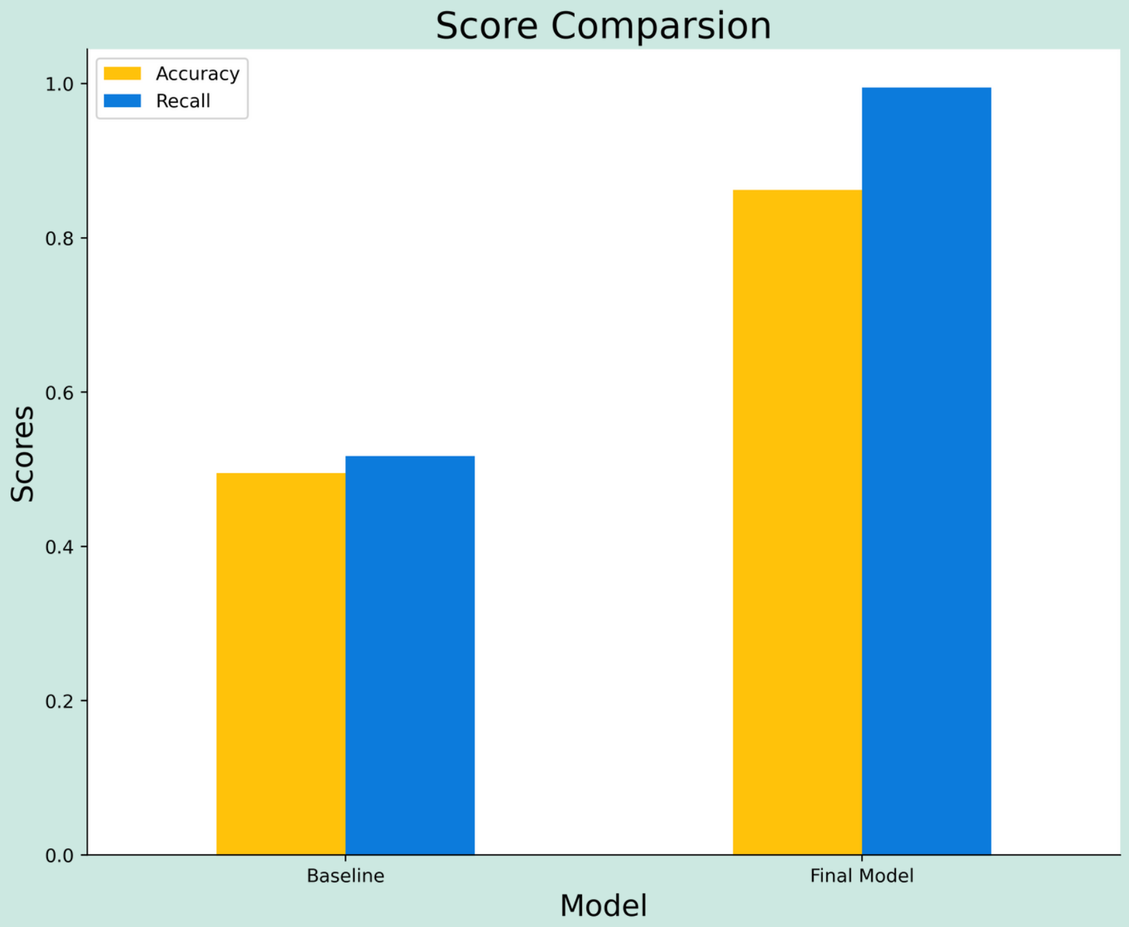
Instead of matrix multiplication it uses convolution in order to reduce images into a form that is easier to process.



Results

Final Model

Results of a CNN



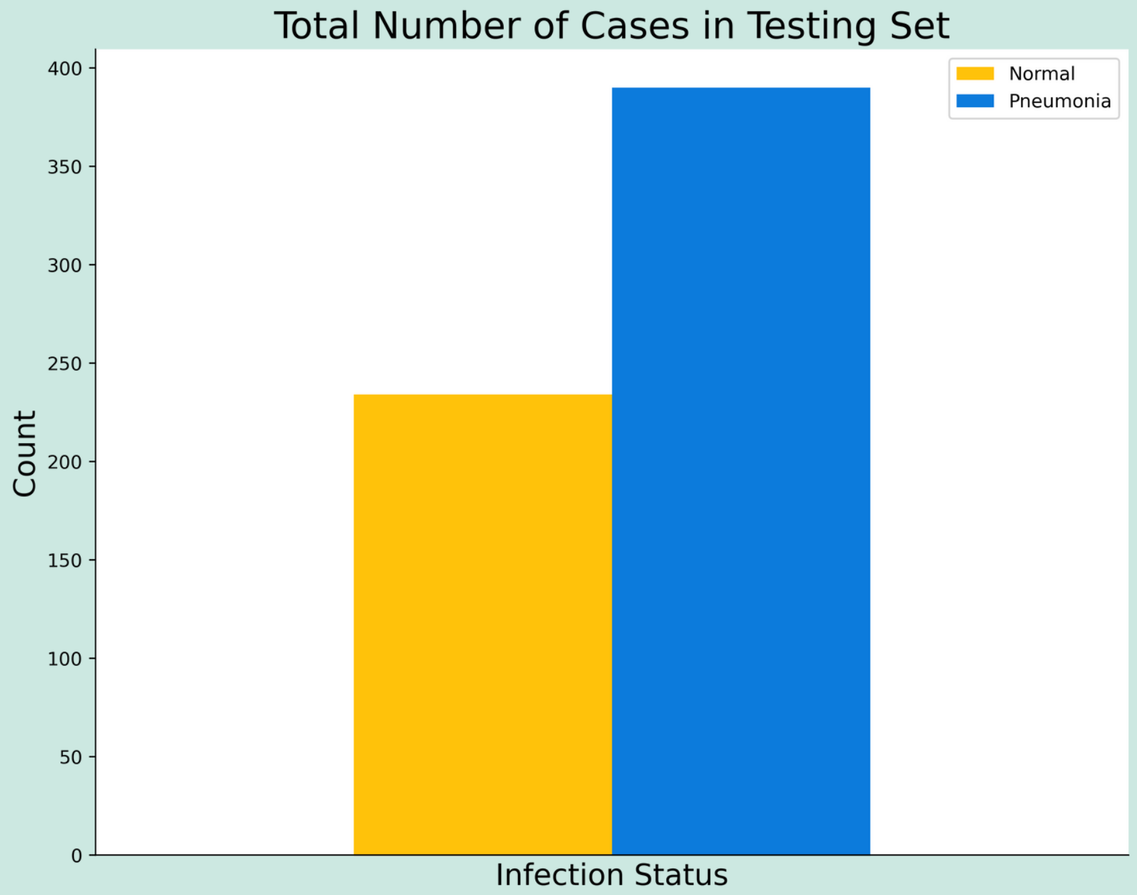
Testing:

- Accuracy = 86%
- Recall = 99%.

Results

Final Model

Results of a CNN



Conclusion

01

SAVING LIVES

- Help avoid missing pneumonia cases
- Allow us to save more lives

02

COST EFFICIENT

- Prevent worsening conditions
- Reduce cost of hospitalizations/treatment

Next Steps

Improving the model

- Further tuning of parameters
- Different augmentations affect the model results.

More Data

- Expanding the demographic
- Increase volume of training data

Get to Know Us

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