



Neural Networks for Medicine

Pneumonia Image Classification - Neural Network Analysis

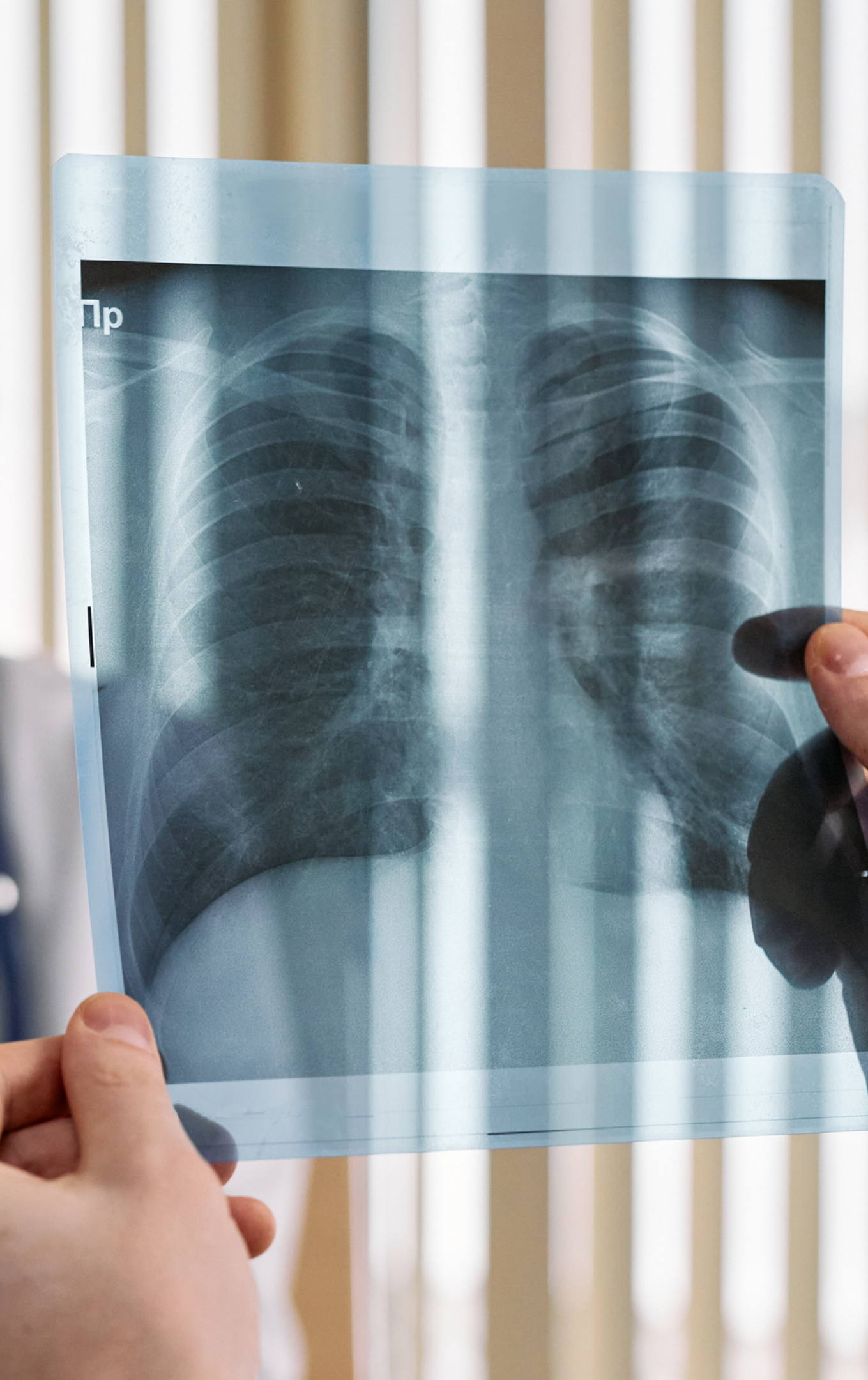
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Presentation Outline

	<u>Today's Topics</u>
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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

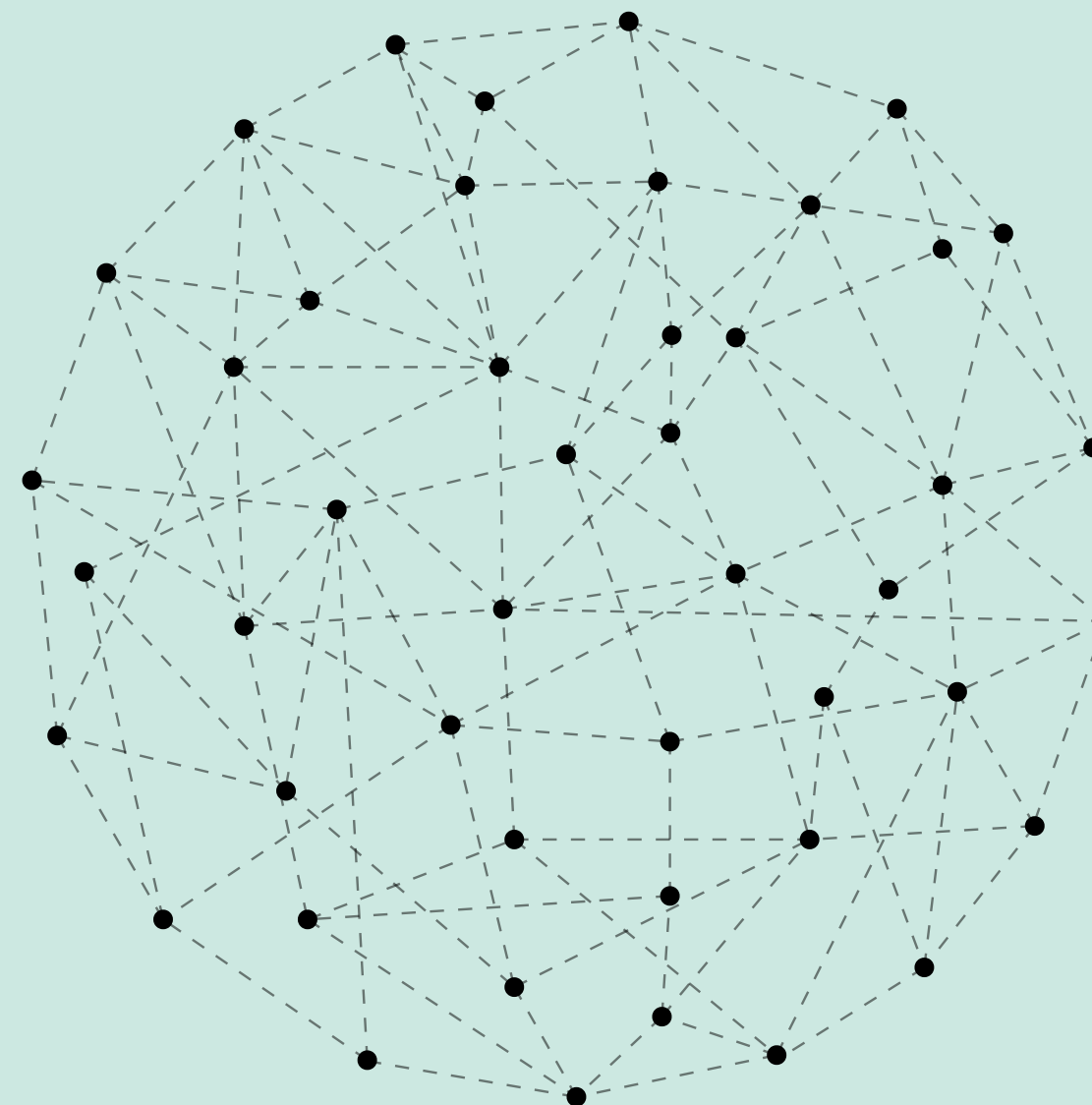
Simply picks positive and negative cases 50/50. Giving us a baseline of 50% scores across the board.

● ● ○ Densely Connected Neural Network

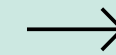
Allows us to specify a neural network, precisely, sequential: from input to output, passing through a series of neural layers, one after the other.

● ● ● Convolutional Neural Network

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

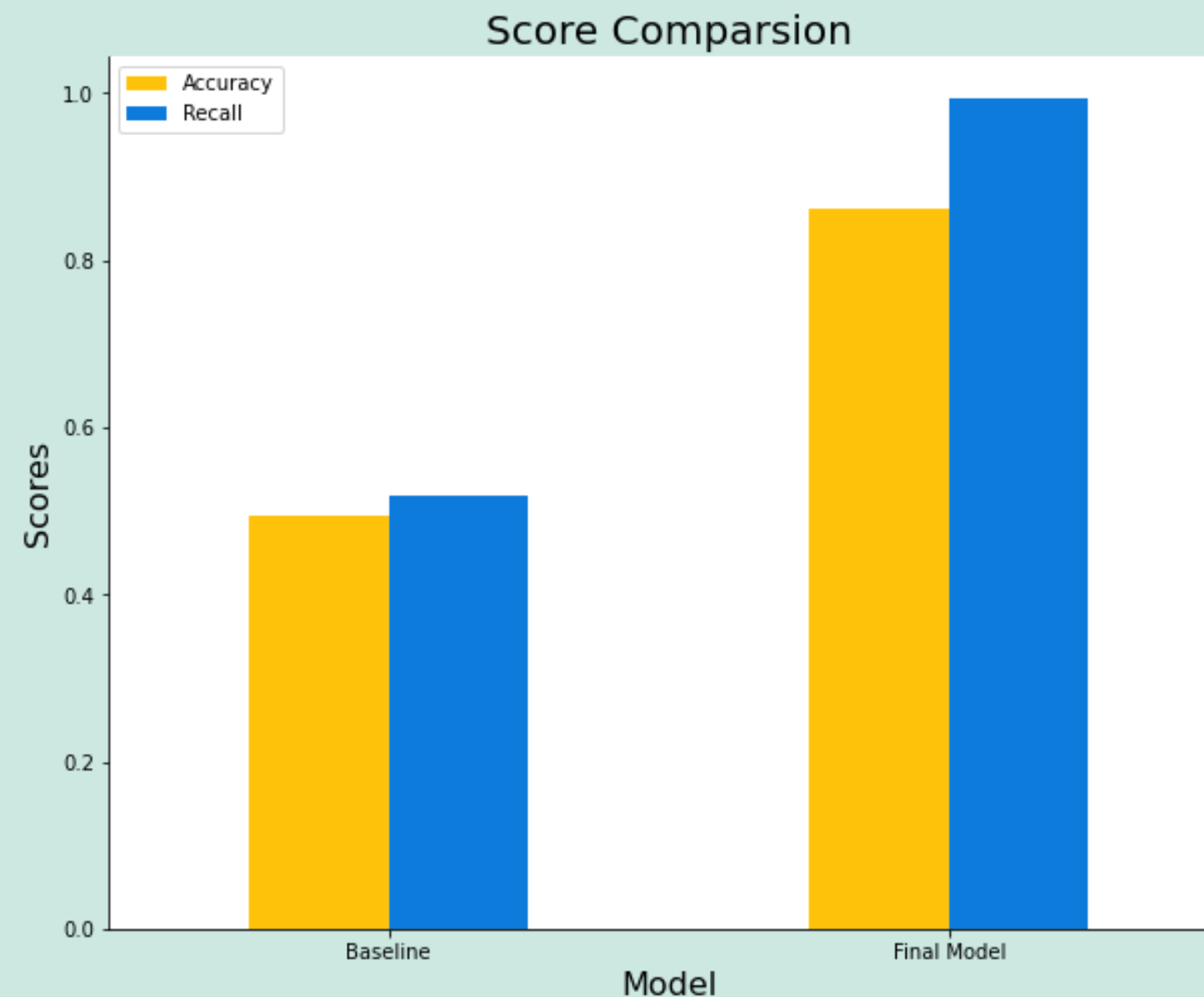


Results



Final Model

Results of a CNN



Model

Testing:

- Accuracy = 86%
- Recall = 99%.

Conclusion

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SAVING LIVES



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

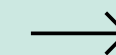


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COST EFFICIENT



- 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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