



Women and Children's Medical Center

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# X-Ray Image Classification of Pneumonia in Pediatrics

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Presented by  
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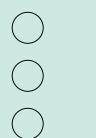


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## Summary →

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Examining neural networks to classify x-ray images of pediatric patients with or without pneumonia based on a dataset from cohorts of patients 1-5 years old in Guangzhou. Understanding these models can help doctors at the Children's Medical Center recognize tools in AI learning and implementation with disease diagnosis.





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# Presentation Outline



Today's Topics

Business Problem >

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Data and Methods >

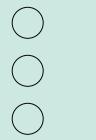
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Results >

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Conclusions >

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# Business Problem

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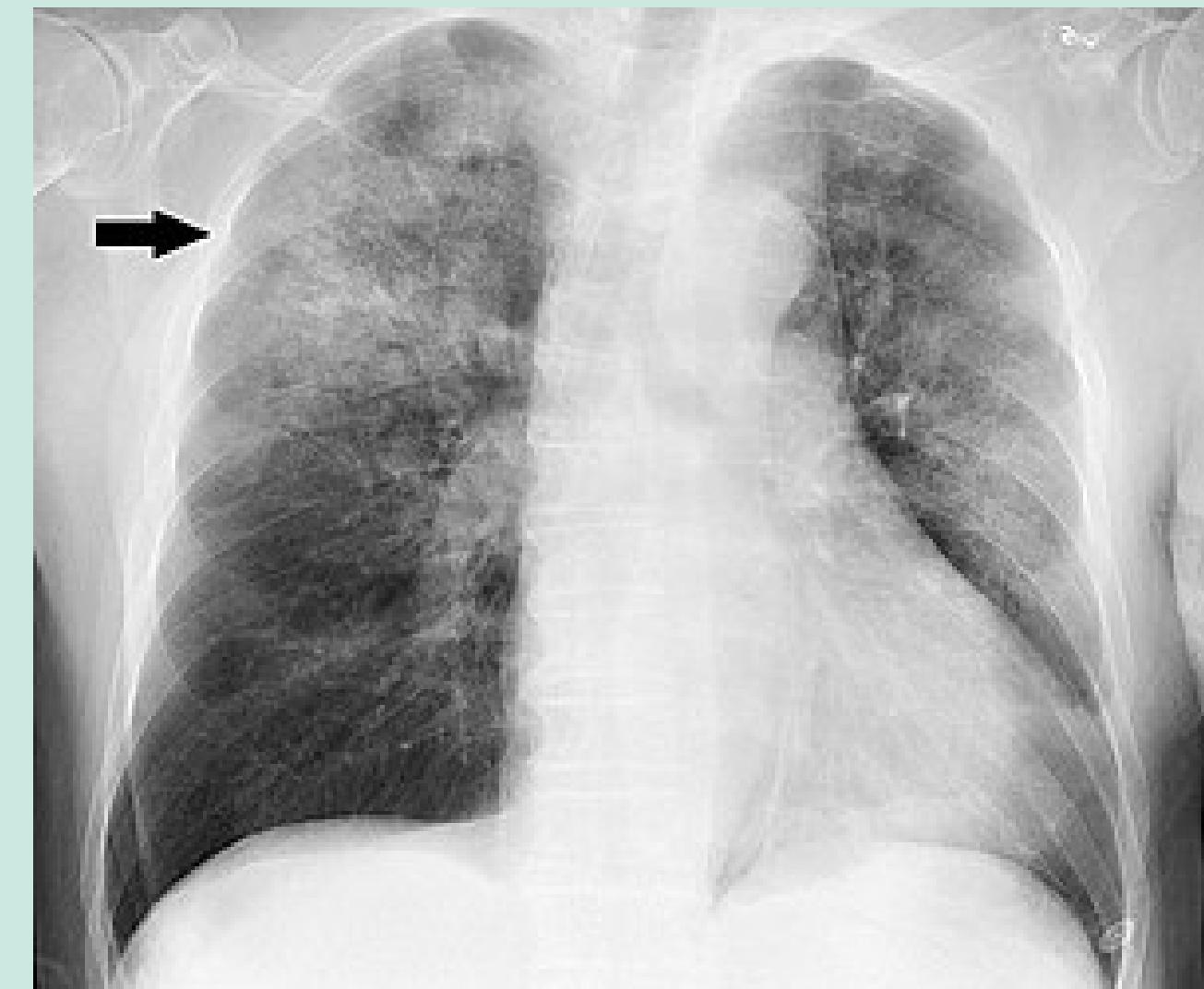
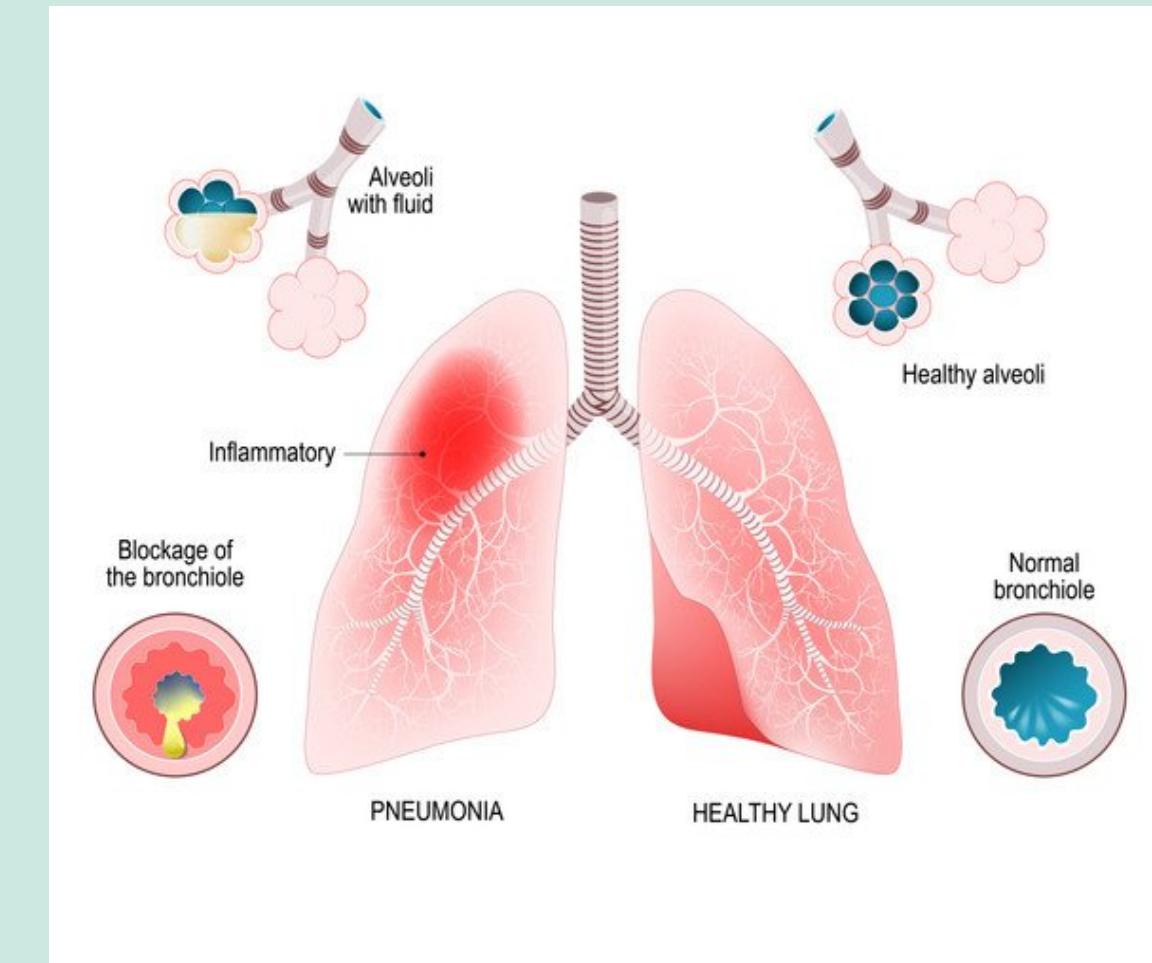
- • Provide insight to medical staff:
- What is deep learning?
  - Neural networks for image classification
  - Can this be used to help detect pneumonia?
  - Overall, how can we use this to inform other medical decisions?





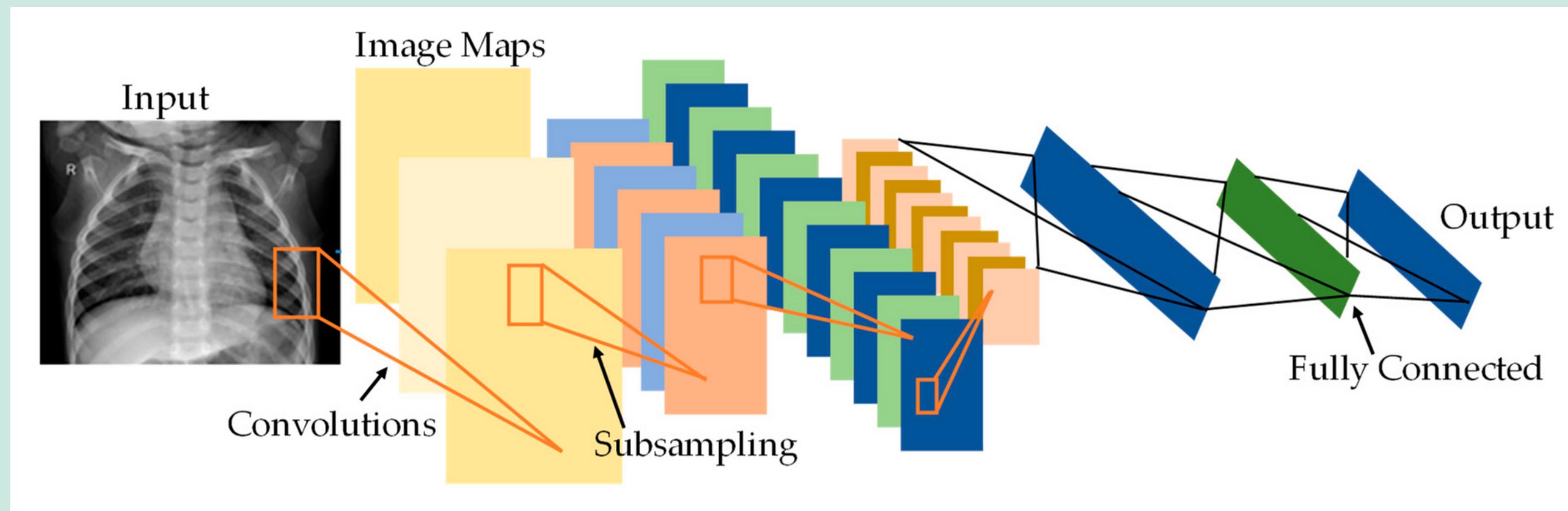
## Pneumonia

- • Very common inflammatory condition found in the lungs
- Particularly common and can be more serious in infants, children, and people over the age of 65
- It can be difficult to diagnose due to the many shared symptoms with other conditions
- Can deep learning help diagnosis?



# Convolutional Neural Networks

A deep learning algorithm that has shown to be an effective tool in image processing.





# Data & Methods

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01

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All x-ray images in the dataset were screened by expert physicians for quality control



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02

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Over 5000 images were split into separate sets for model validation.



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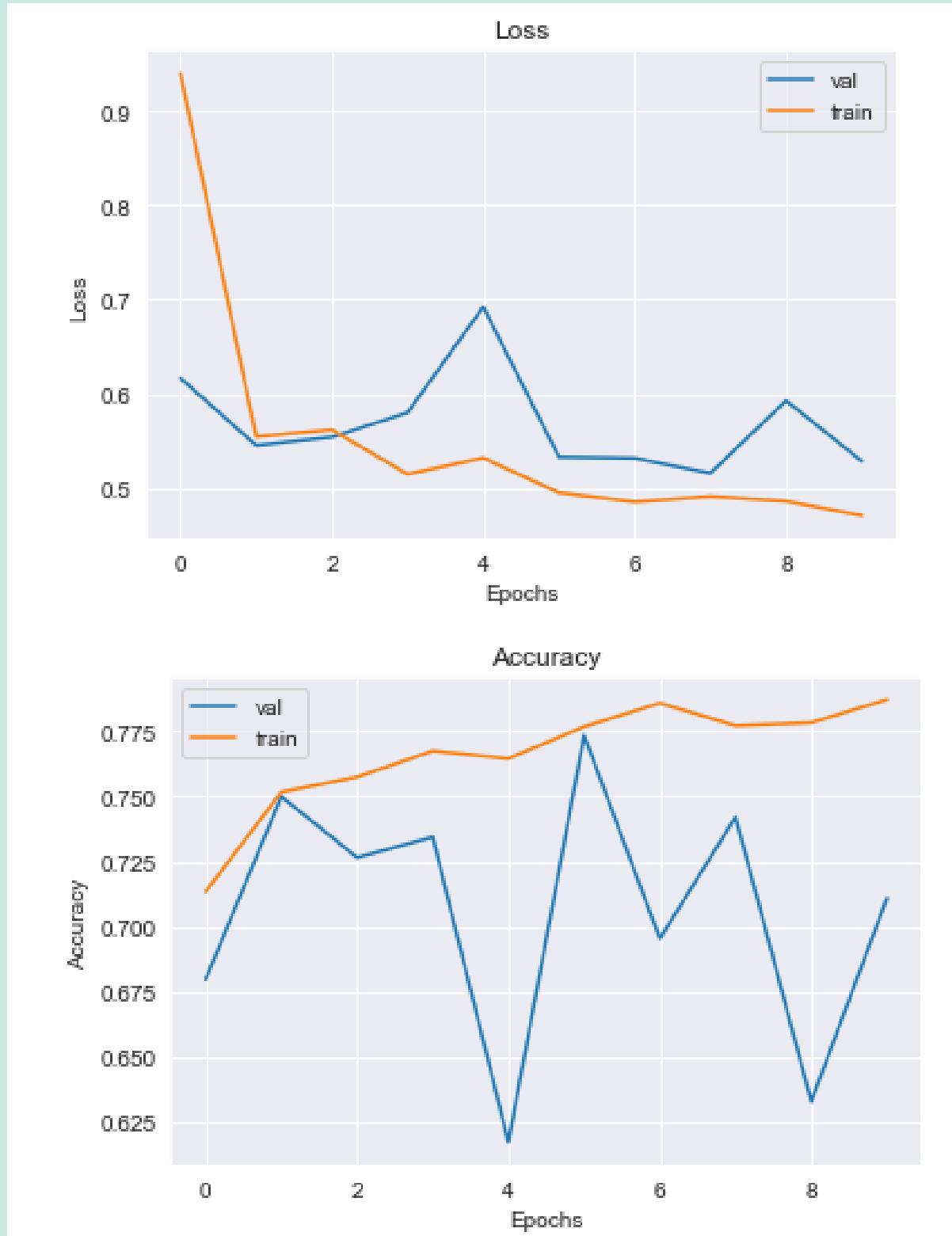
03

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Iterative process starting with a baseline model to different convolutional neural networks.



# Baseline Model

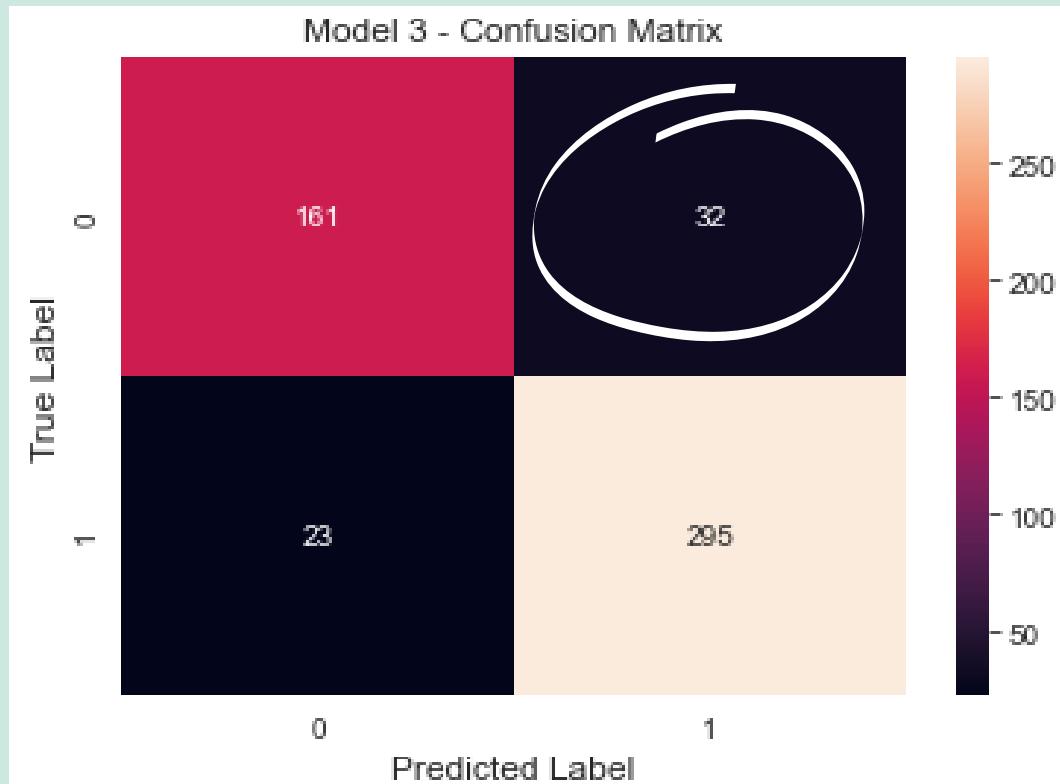


- Did not have any convolutional layers
- Validation accuracy scores lower than training scores (overfitting)
- Accuracy of 72%

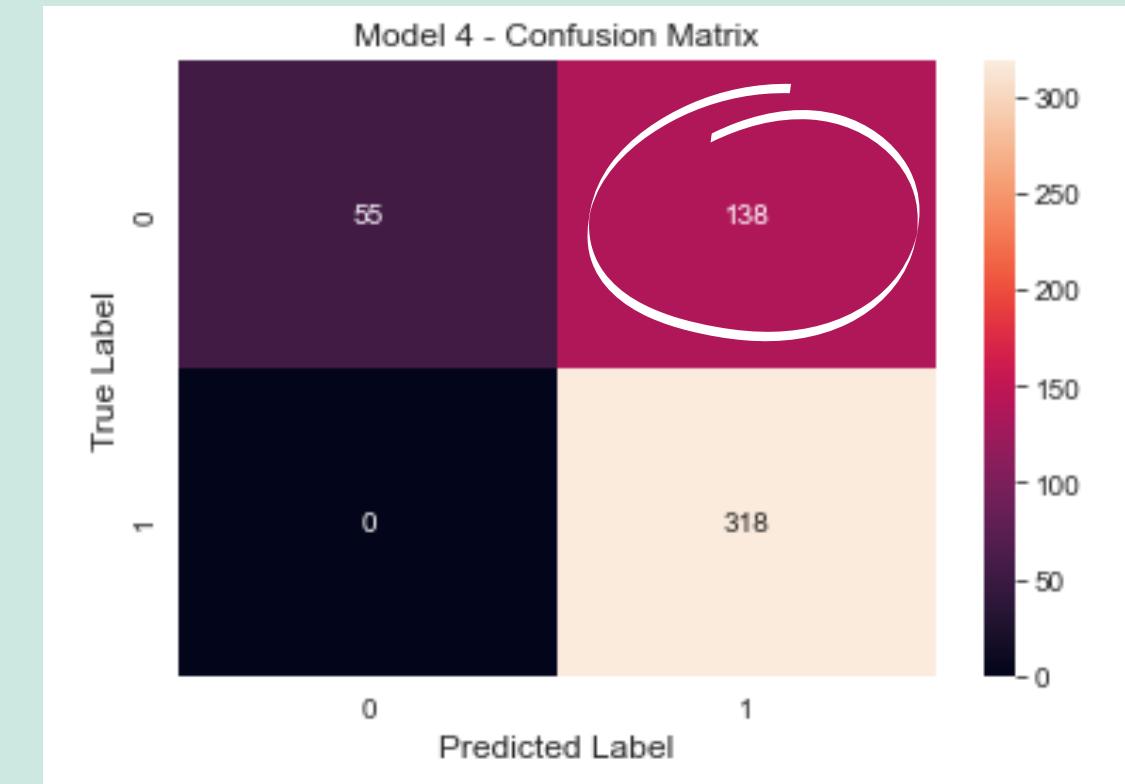
# CNN & ResNet50



- The 3rd model:
  - Not as deep
  - Accuracy of 89%
  - Recall of 93%



- The 4th model:
  - Classic very deep neural network architecture
  - Accuracy of 73%
  - Recall of 100%



# Conclusions

## ● ○ ○ Success in neural networks

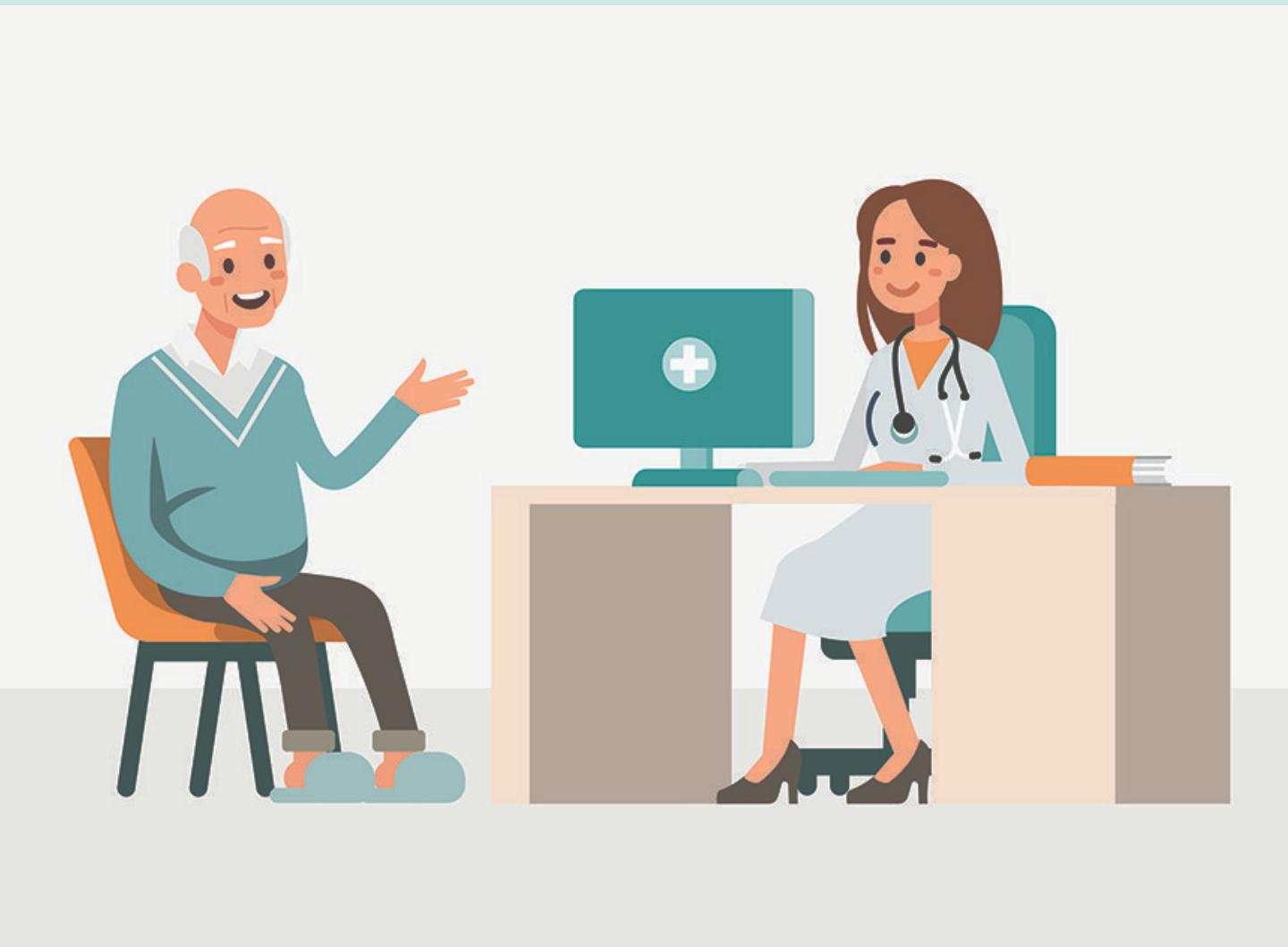
Deep learning, specifically convolutional neural networks was able to predict whether or not there was no pneumonia in patients.

## ● ● ○ Can further inform medical staff

Deep learning can help and provide additional information to medical staff.

## ● ● ● Greater things to come

More understanding and success of these models can be increased with additional iterations and research.





# Thank you!

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For questions, comments and  
inquiries:

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