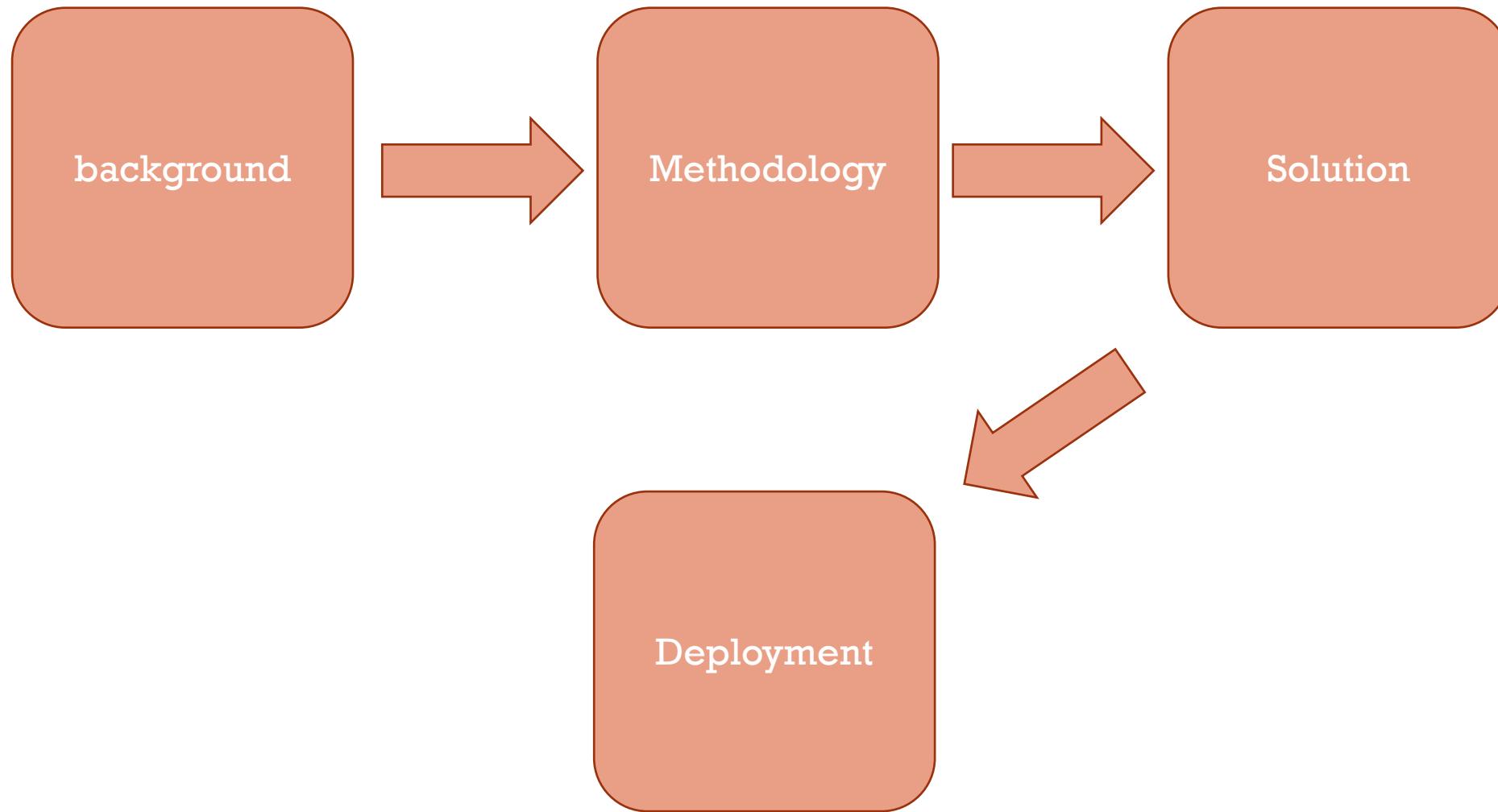


MACHINE LEARNING FOR MEDICAL PROBLEMS

By Paul Williams



ROAD MAP

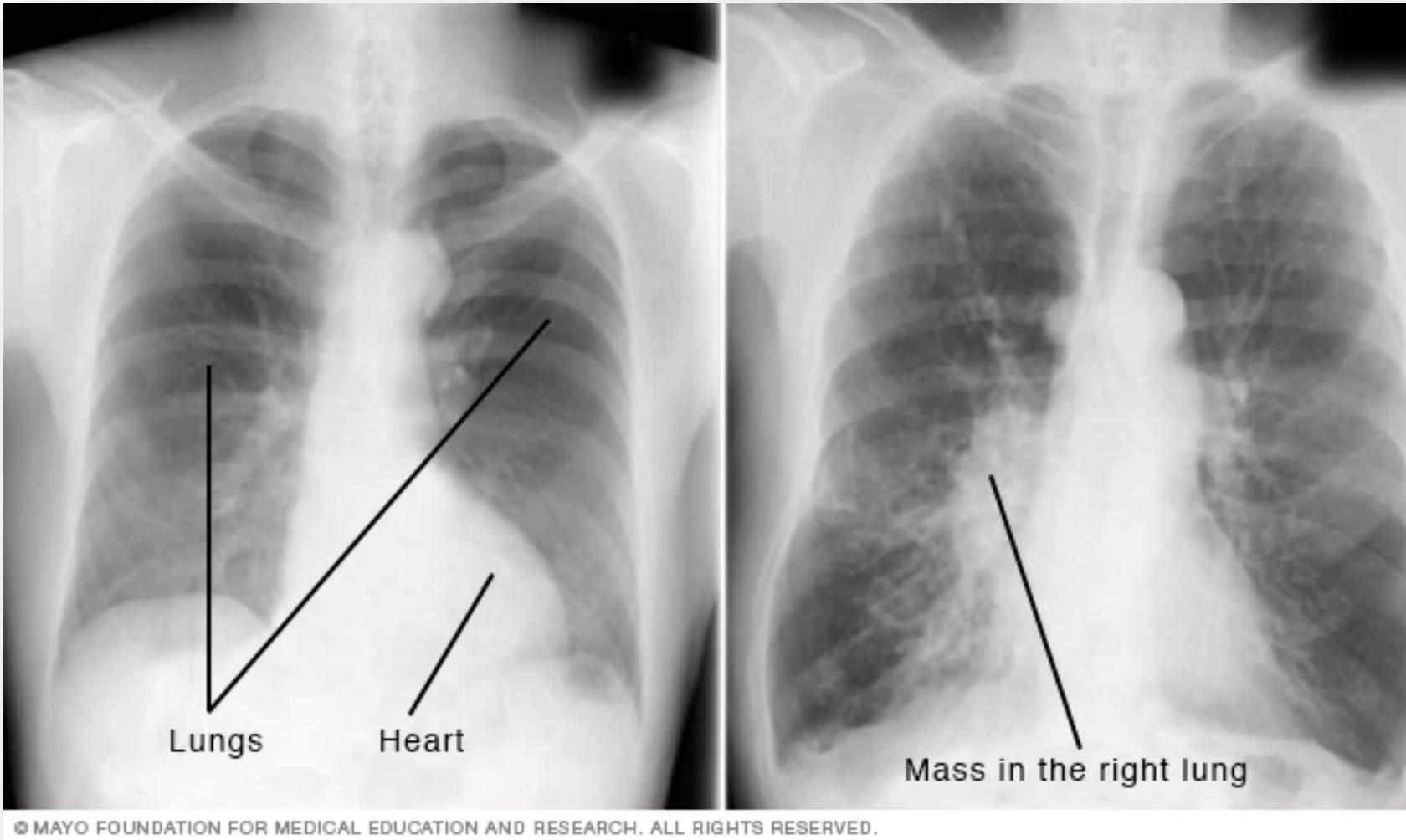


BACKGROUND

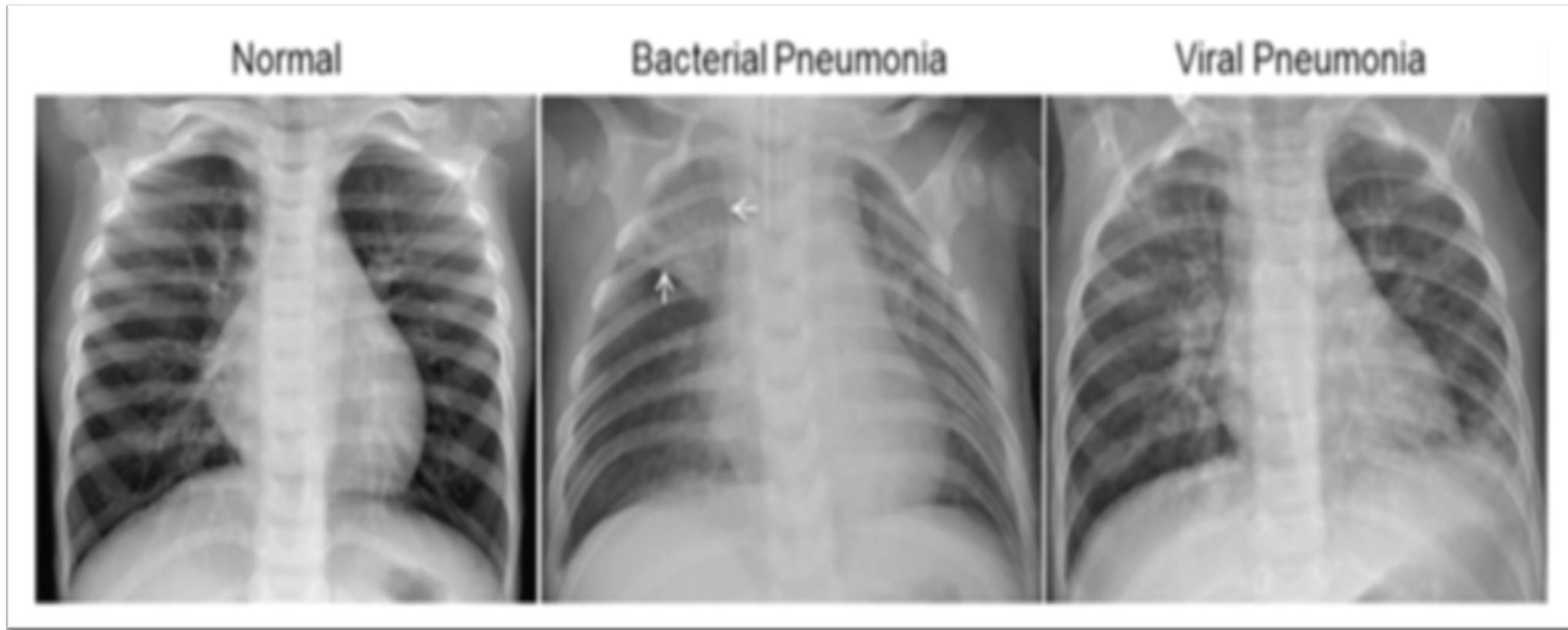
- Pneumonia is both a viral and bacterial infection that targets the lungs
- When a patient comes into a hospital with symptoms: shortness of breath, chest pain, etc.. A chest x-ray can be given.
- A doctor will then analyze the x-ray and determine if the patient has a viral or bacterial infection.
- Using machine learning we can automate this process and distinguish an infected patient from a normal.
- Early detection can help save lives



WHAT TO LOOK FOR



WHAT INFECTION LOOKS LIKE



METHODOLOGY

- To solve the problem we understand there are only 2 outcomes

pneumonia

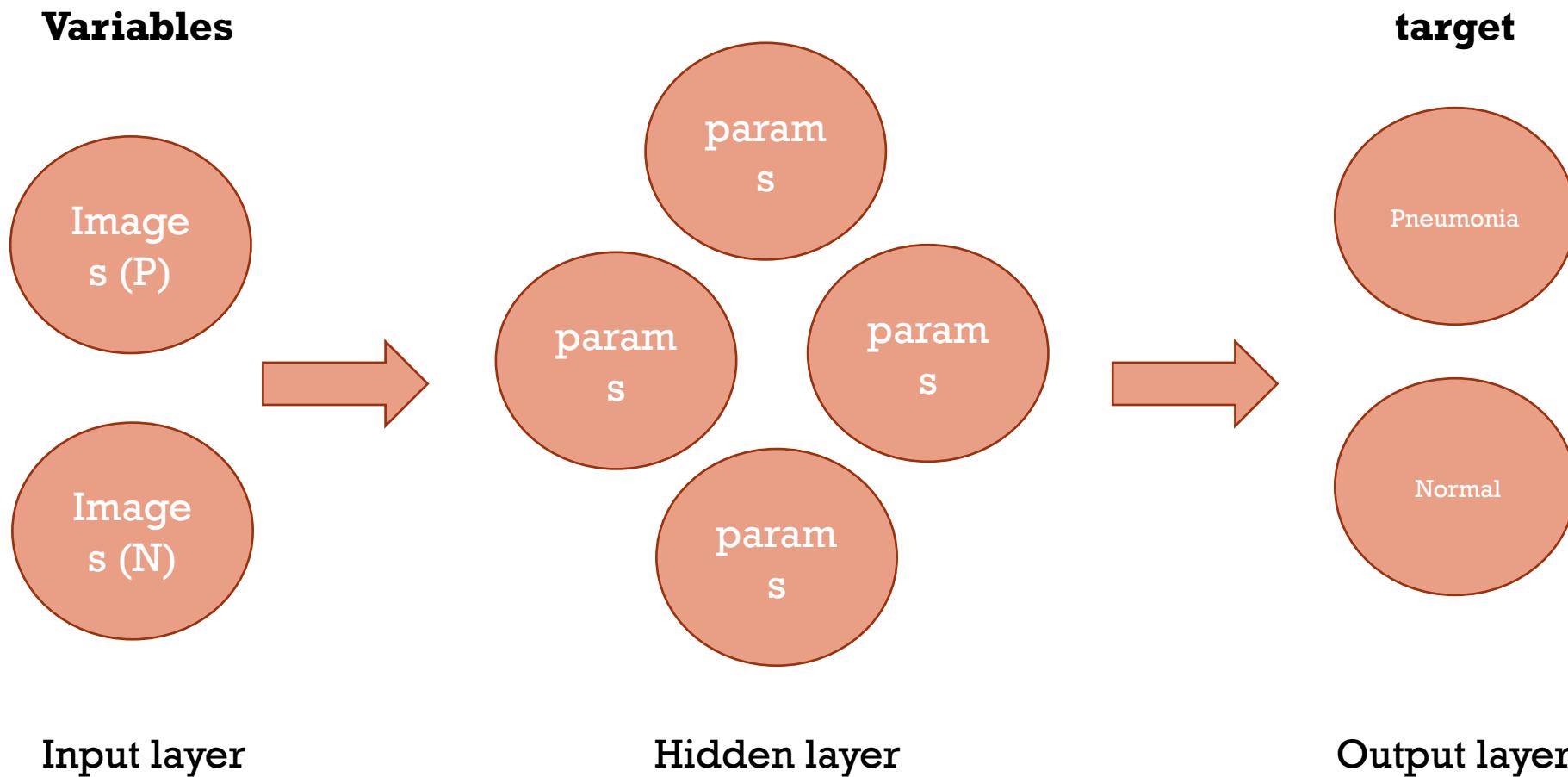
normal

- That makes this a binary classification problem
- I created 3 data sets of over 6,000 images of both infected and normal x-rays and then had to decide on a model to learn the patterns of the images.



METHODOLOGY

- In this case I used a neural network algorithm



SOLUTION

- The model was 82% accurate and out of 624 samples it guessed 506 correctly
- Based on 50% threshold selection:

TN = 379

FN = 107

TP = 127

FP = 11

