Is It Pneumonia?

Image Recognition as a Diagnostic Tool

Richard Hinds
Nick Kennedy
Ilene Sorto

Meet the Team

Richard Hinds
Data Scientist
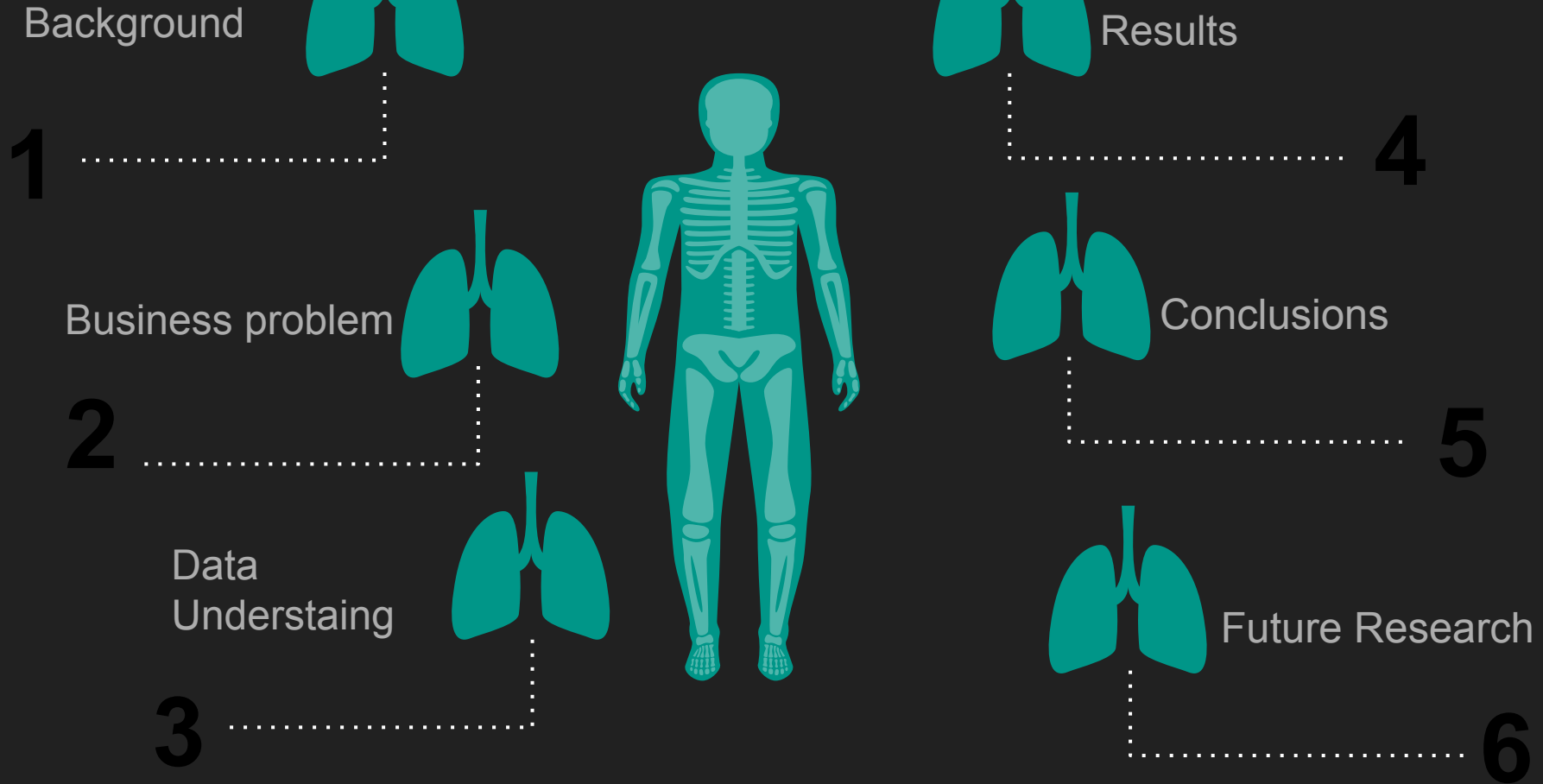https://github.com/RH3421

Nick Kennedy
Data Scientist
https://github.com/nikennedy

Ilene Sorto
Data Scientist
https://github.com/ileneee

AGENDA

Background

1

Business problem

2

Data
Understaing

3

Results

4

Conclusions

5

Future Research
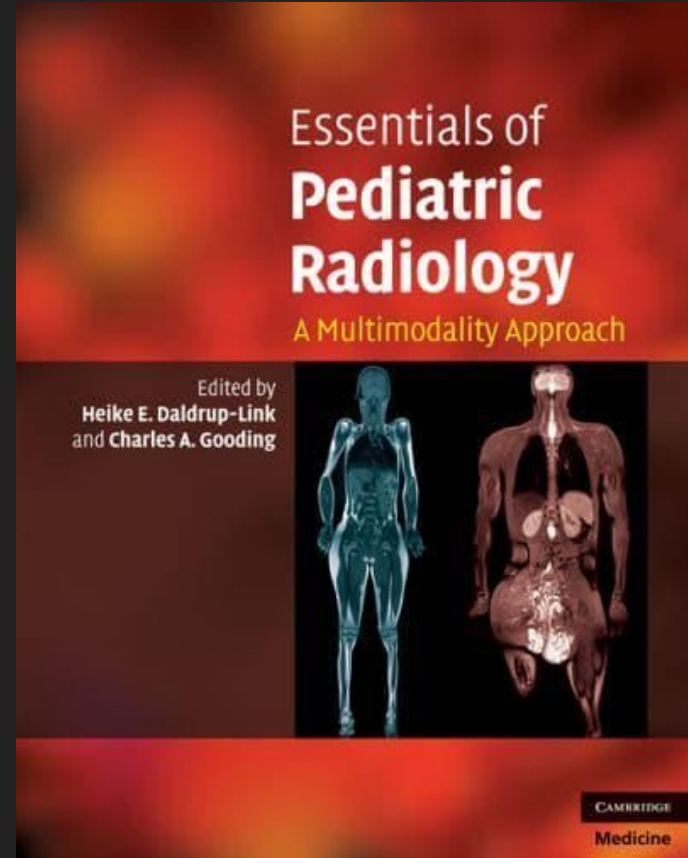
6

Background

Pediatric pneumonia

affects **1 in 71 children** annually

responsible for **2,200 deaths** daily

Background

Pediatric radiologists
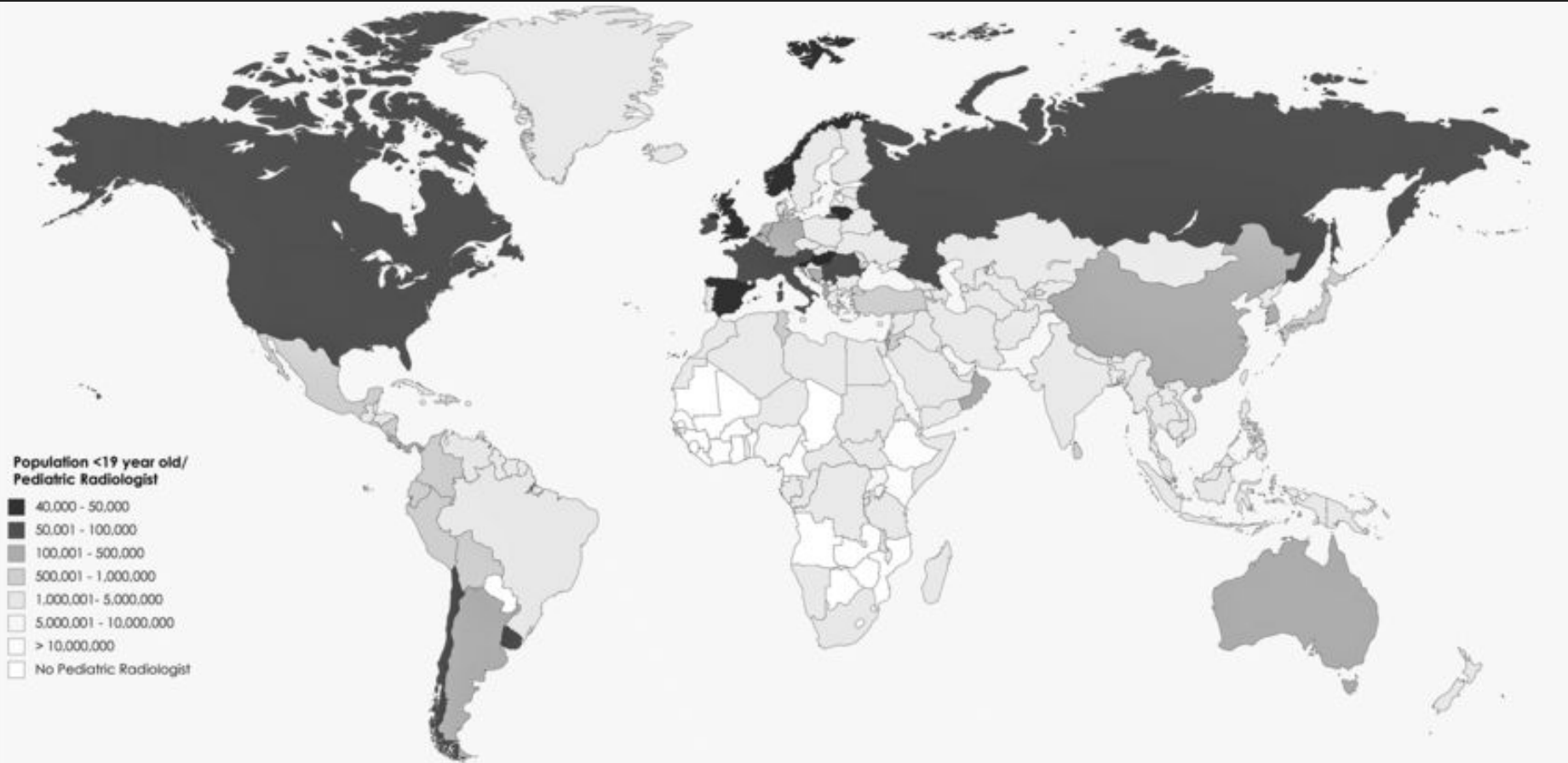
Highly valued

Disparate distribution

Essentials of
Pediatric Radiology
A Multimodality Approach

Edited by
Heike E. Daldrup-Link
and **Charles A. Gooding**

CAMBRIDGE
Medicine

Background

Population <19 year old/
Pediatric Radiologist

- ■ 40,000 - 50,000
- ■ 50,001 - 100,000
- ■ 100,001 - 500,000
- ■ 500,001 - 1,000,000
- ■ 1,000,001 - 5,000,000
- □ 5,000,001 - 10,000,000
- □ > 10,000,000
- □ No Pediatric Radiologist

Business Problem

Less pediatric radiologists,
more images to read

Delays in diagnosis

Treatment failures

Diagnostic Support Tool

Data Understanding

Number of pediatric chest xrays: **5,224**

   Normal chest xrays: **1,341**

   Pneumonia chest xrays: **3,883**

Metric of choice: **Recall**

Data Understanding

Normal

Pneumonia

R

R

Neural Net Model

Convolution +
nonlinearity

max-pooling

+

-

Convolution + pooling layers

Fully-connected
layers

Output classes
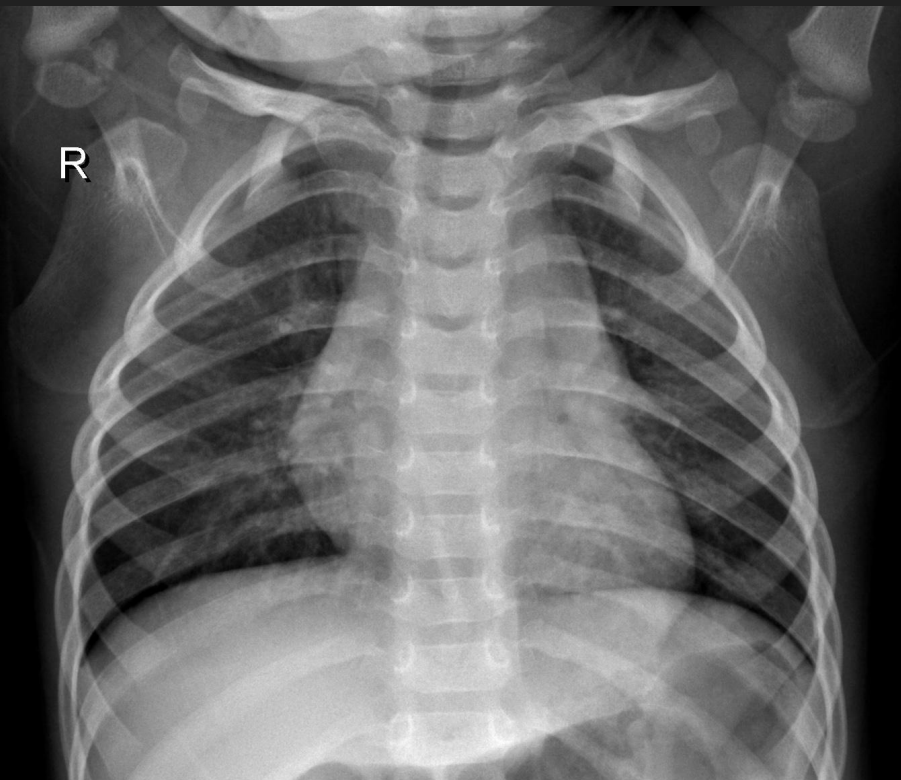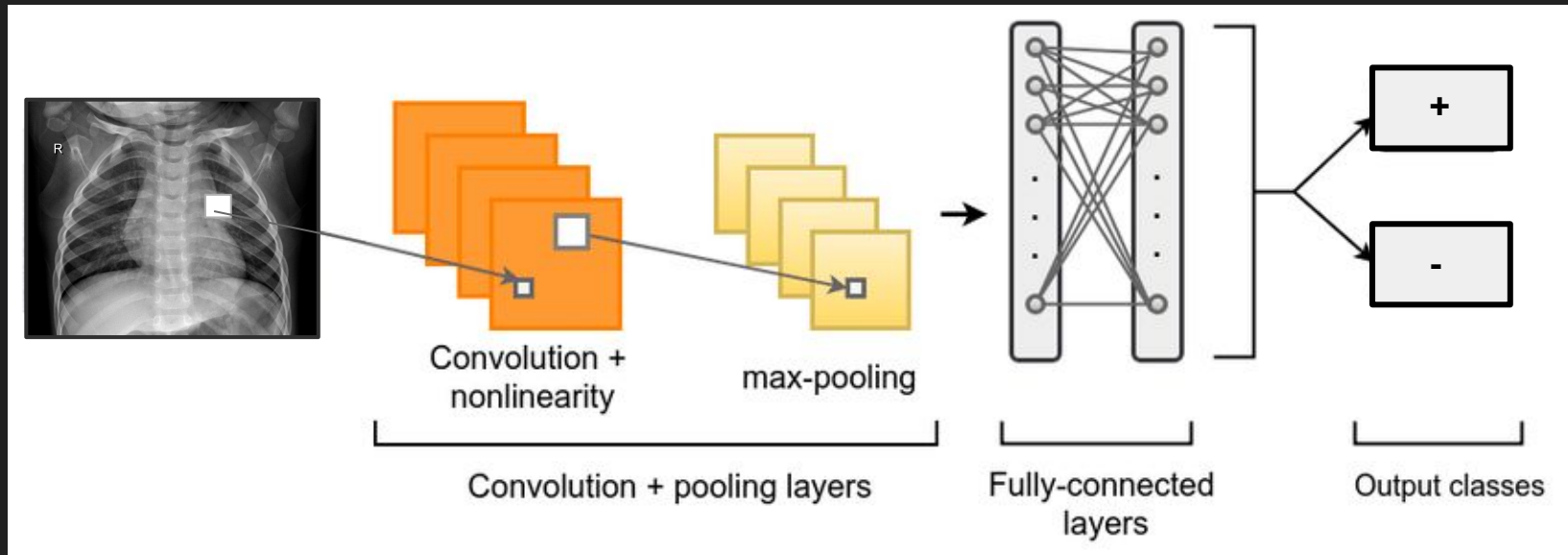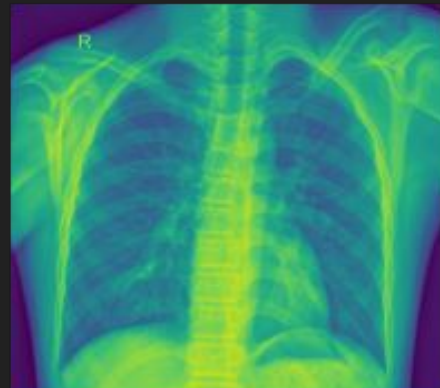
Results

95% Recall

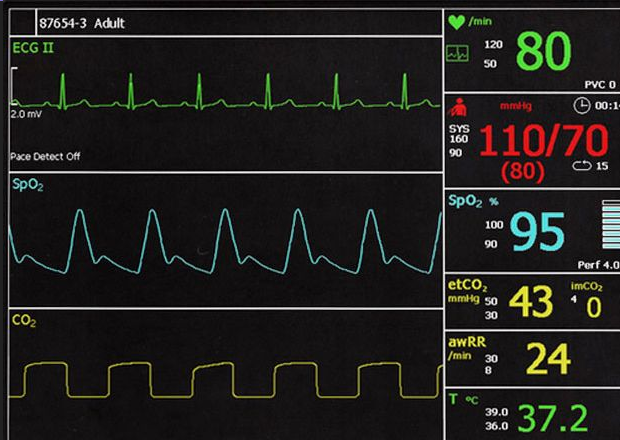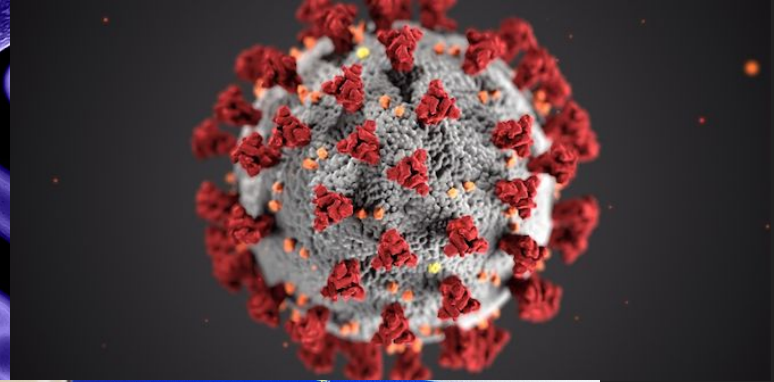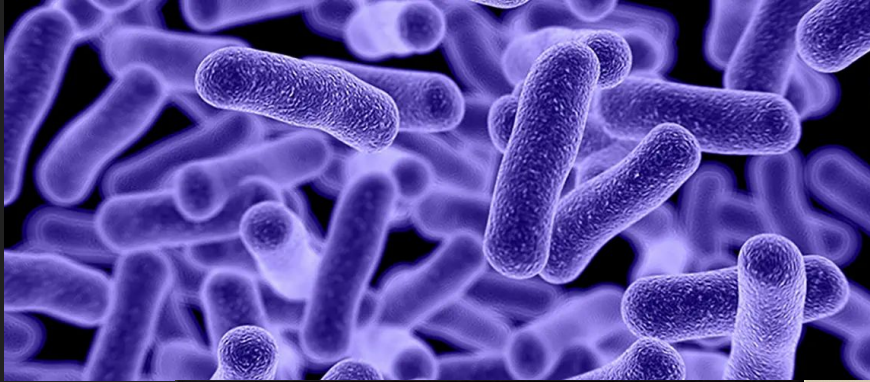*Only 1 of 20 cases not identified*
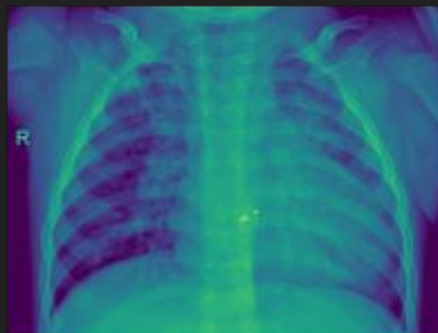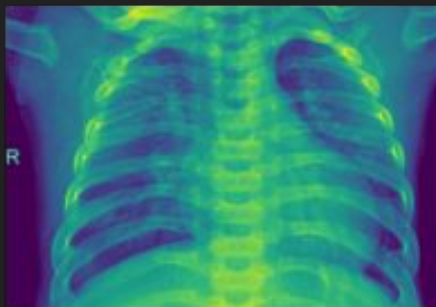
Conclusions

Our model accurately identifies pneumonia in children **95%** of the time

Future Research

Thank You

Richard Hinds
Data Scientist
https://github.com/RH3421

Nick Kennedy
Data Scientist
https://github.com/nikennedy

Ilene Sorto
Data Scientist
https://github.com/ileneee

APPENDIX