Detecting Pneumonia via X-Rays

Image Classification with Deep Learning

Chris Delacruz and David Tian

01
THE PROBLEM

02
DATA OVERVIEW
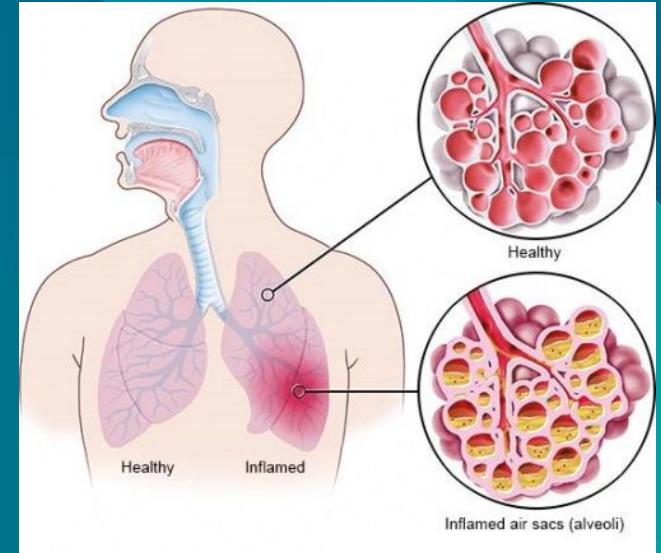
03
MODELING

04
NEXT STEPS

01

THE PROBLEM

Pneumonia - Overview

- Single largest cause of death in children worldwide.[1]

- Every year, it kills an estimated 1.4 million children under the age of five years[1]
  - 18% of all deaths of children under five years old worldwide.[1]

- Almost all of these deaths are preventable, and early detection can save lives.

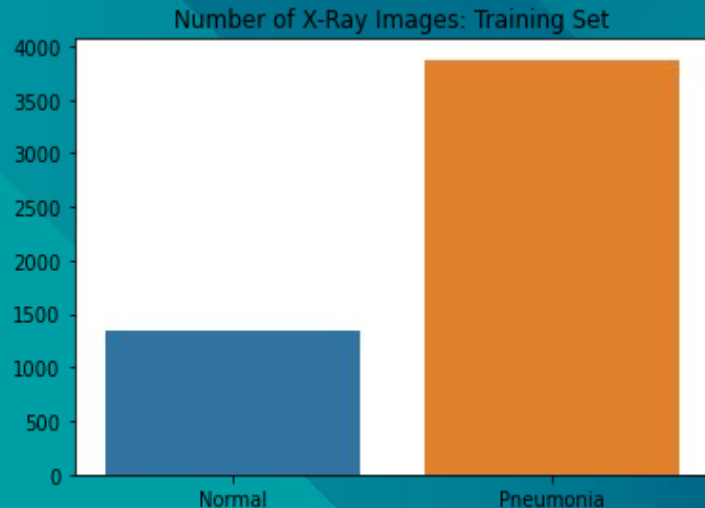[1]https://www.who.int/maternal_child_adolescent/news_events/news/2011/pneumonia/en/
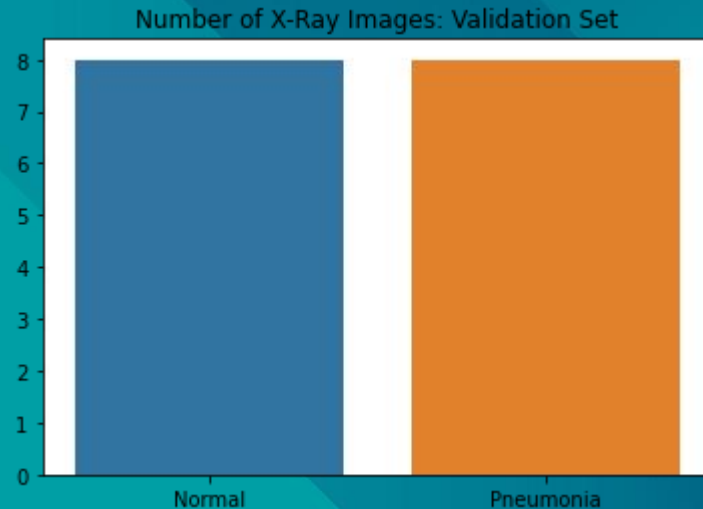
02

DATA OVERVIEW

Data – Overview

X-ray images from pediatric patients from 1 – 5 years old from China. X-rays were graded by two expert physicians, and checked by a third expert.
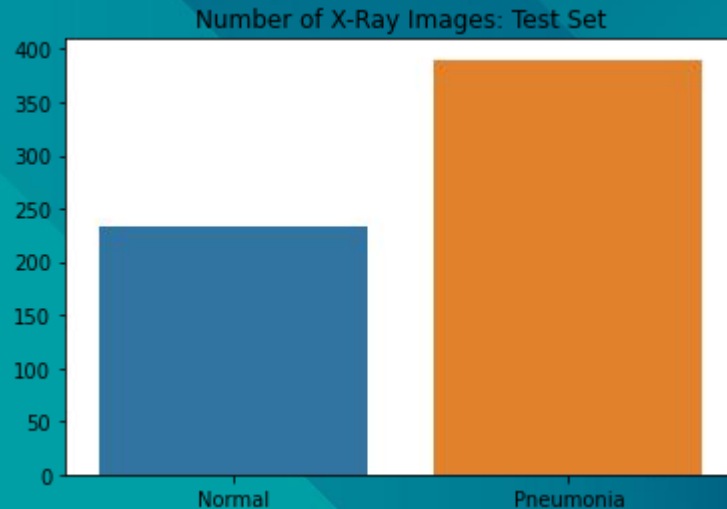

1,341 normal training images
3,875 pneumonia training images

Data - Overview

Number of X-Ray Images: Validation Set

8 normal validation images
8 pneumonia validation images

Data - Overview

Number of X-Ray Images: Test Set
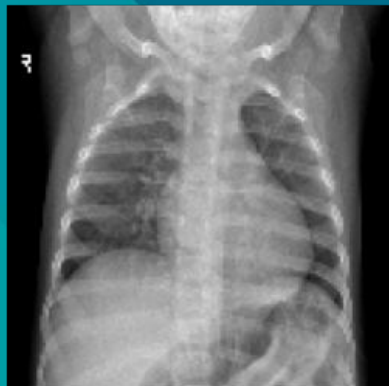
234 normal test images
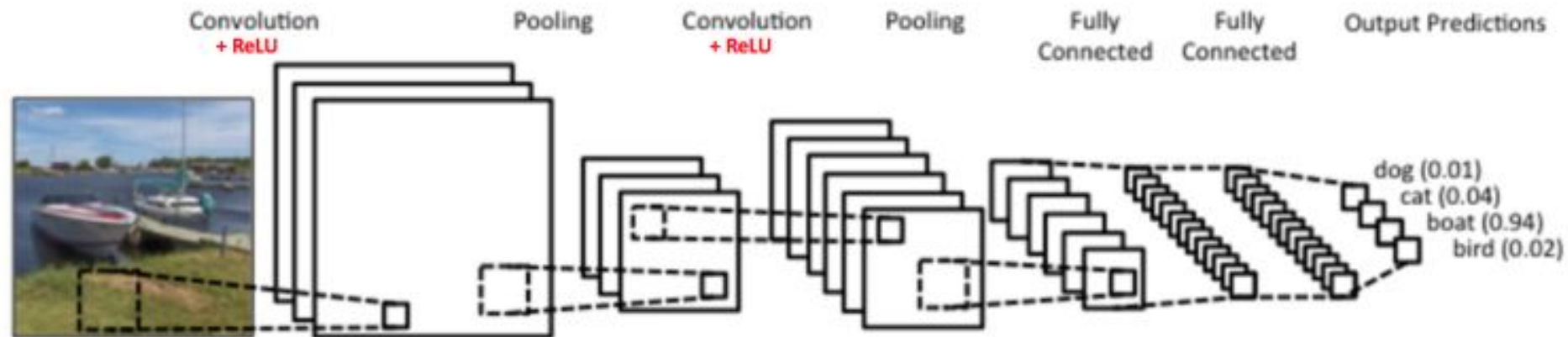290 pneumonia test images

Data - Overview

03

MODELING

Modeling

Modeling Part 2

Final Output: Pneumonia or Normal?

- Baseline Model had 62.5% accuracy
- Best performing model was LeNet-5 with 79% accuracy (with still lots of room for improvement but more time is needed to do so)

04

NEXT STEPS

Next Steps– Further Analysis

- Test out additional CNN architectures (there's at least 8 other architectures we didn't get the chance to test)
- More experiments with regularization on existing models
- Additional data (especially normal X-Rays)
- Pneumonia X-Rays for other age groups

THANKS

Do you have any questions?
addyouremail@freepik.com
+91 620 421 838
yourcompany.com