Helping Humanitarian Aid Workers Identify Pediatric Pneumonia

presented for the American Red Cross

Hailstorm Analytics

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Overview

Business Problem

01

Humanitarian aid workers need tools to help identify those at risk.

About the Data

02

Our team gathered sample data of pneumonia in children aged one to five.

Model

03

We tested models that could accurately predict pneumonia cases.

Conclusions

04

We identified our best model and scored its performance.

Every **43 seconds,**

a child dies due to pneumonia.[1]

Pneumonia is the most lethal infectious disease among children ages one to five worldwide.

[1]According to UNICEF data

Business Problem

01 Targets developing nations

Countries in South Asia and sub-Saharan Africa are most at risk.

02 Too many cases

Aid workers currently lack the resources to treat all in need.

03 **Need more tools**

Humanitarian organizations like American Red Cross require better tools to identify those at risk.

About the Data

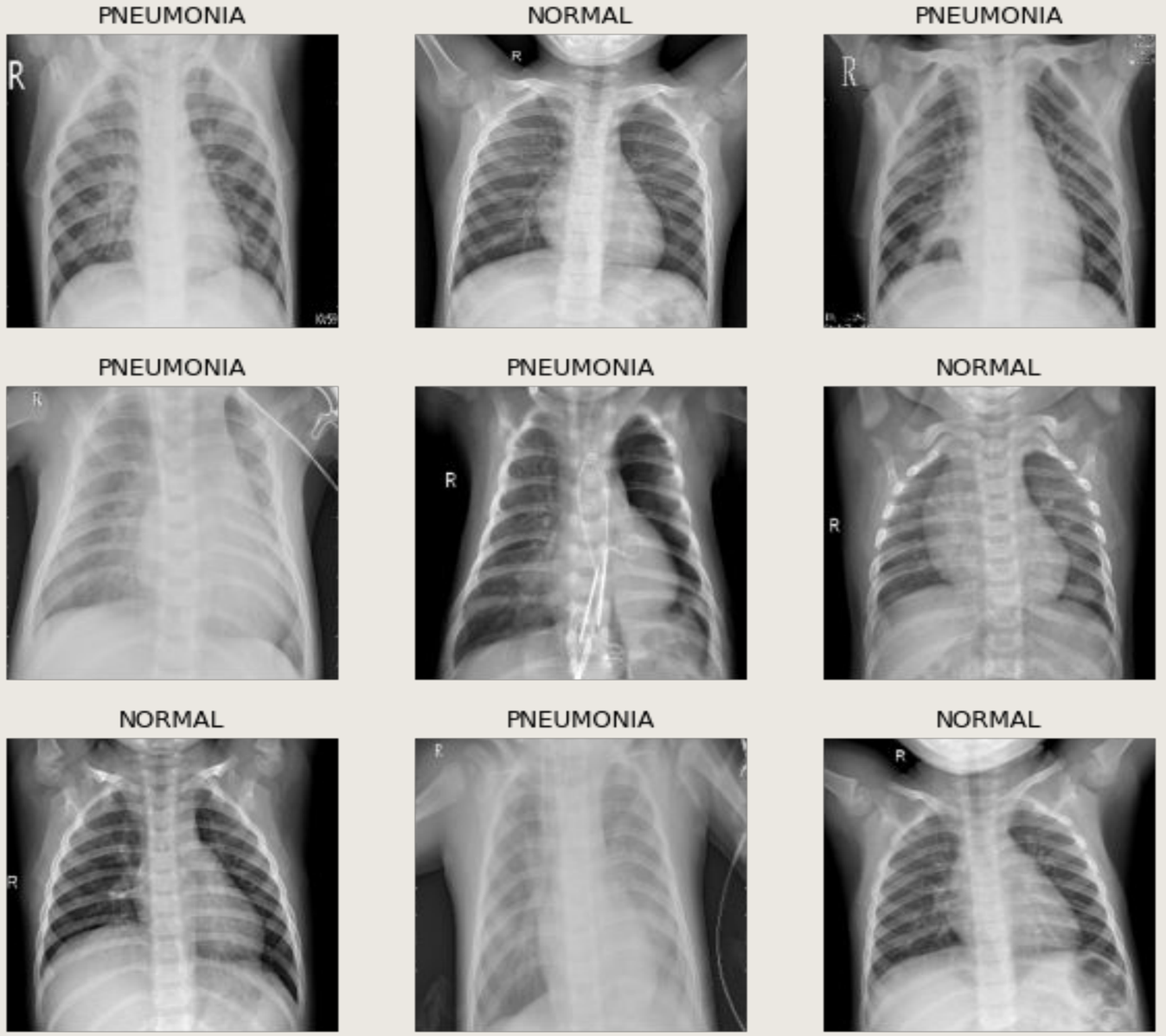
Published in 2018	~6,000 images
Collected by researchers at UCSD	Guangzhou Women and Children's Medical Center
Children aged one to five	Verified results by three separate experts

Key Performance Metrics

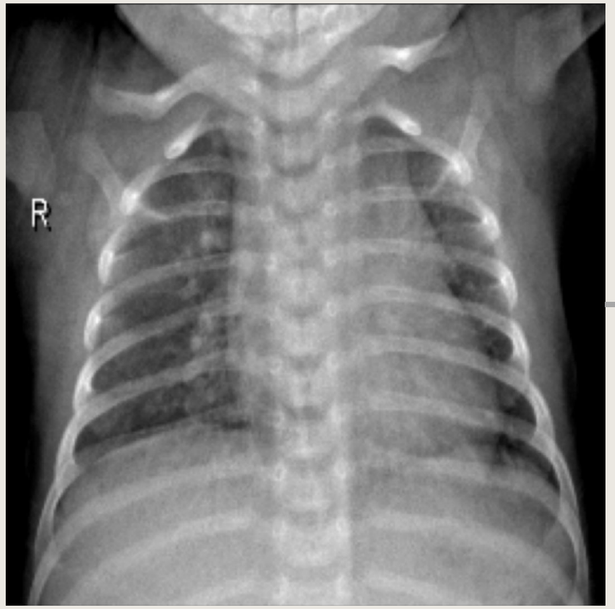
Identify true positives

Make correct predictions

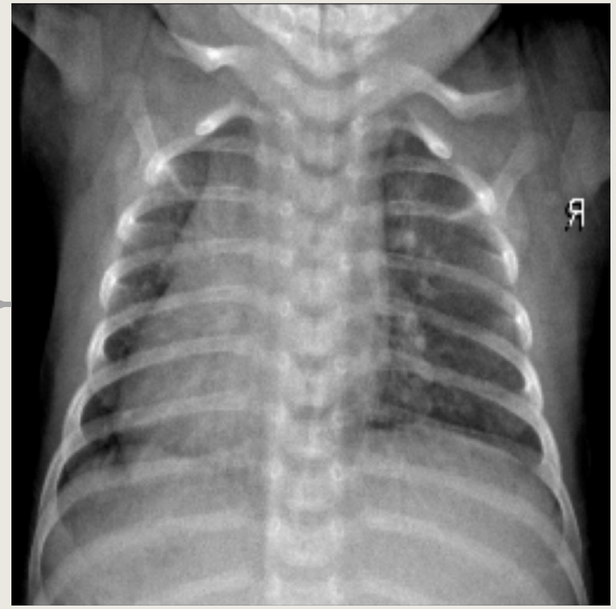
Example Data



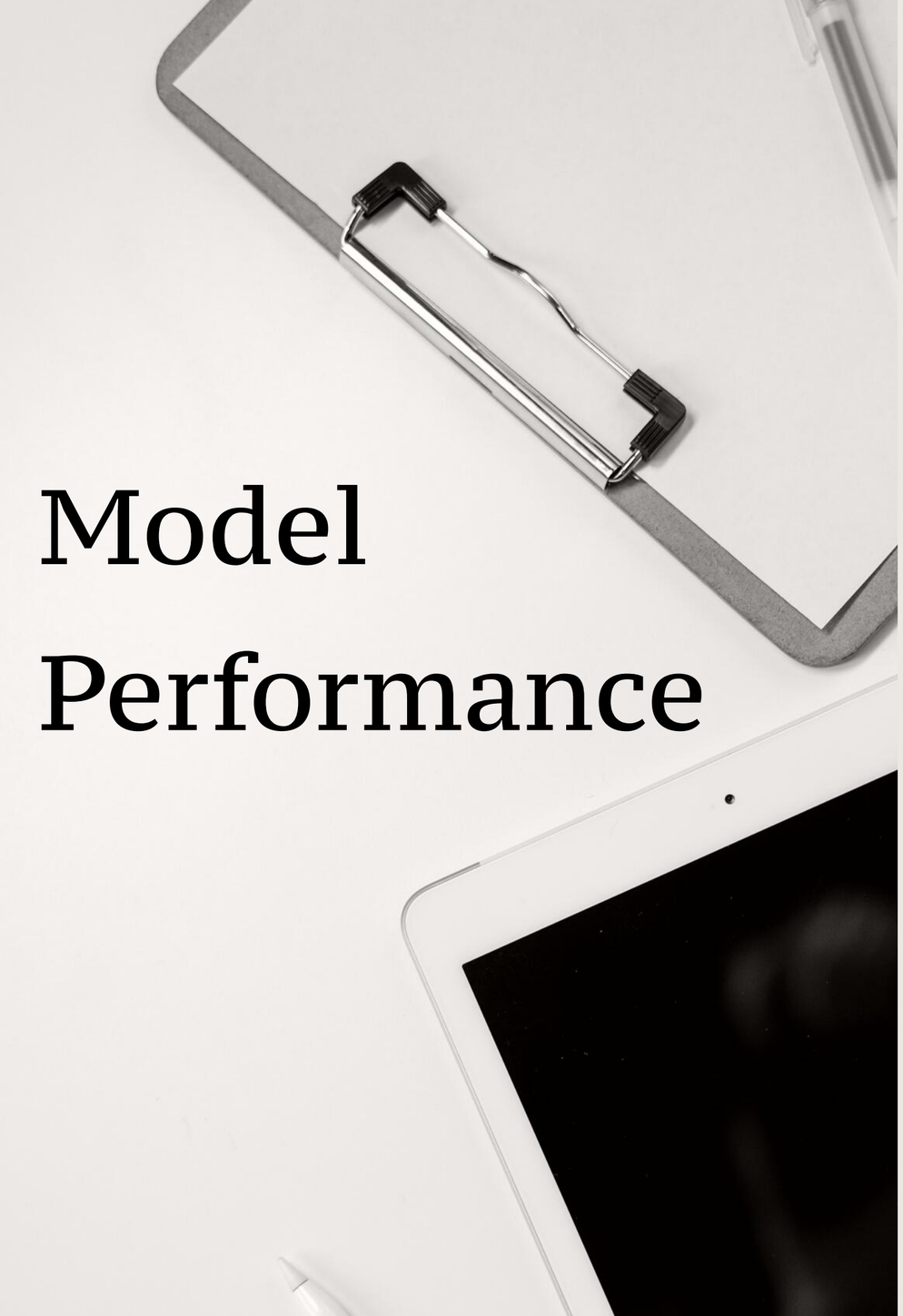
Augmentations



Horizontal Flip



Random Rotation



Model Performance

Model	Recall	Accuracy
Logistic Regression	98%	75%
Random Forest	99%	74%
Support Vector Machine	98%	76%
Convolutional Neural Network	99%	90%

Final Model

- **99% Recall**
- **90% Accuracy**

Future Insights

Acquire More Data

Improve model performance

Expand Disease Detection

Identify other common conditions

Multiclass Classification

Viral vs bacterial pneumonia

Thank You!

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