

Lungify

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DEMO



About the Diseases

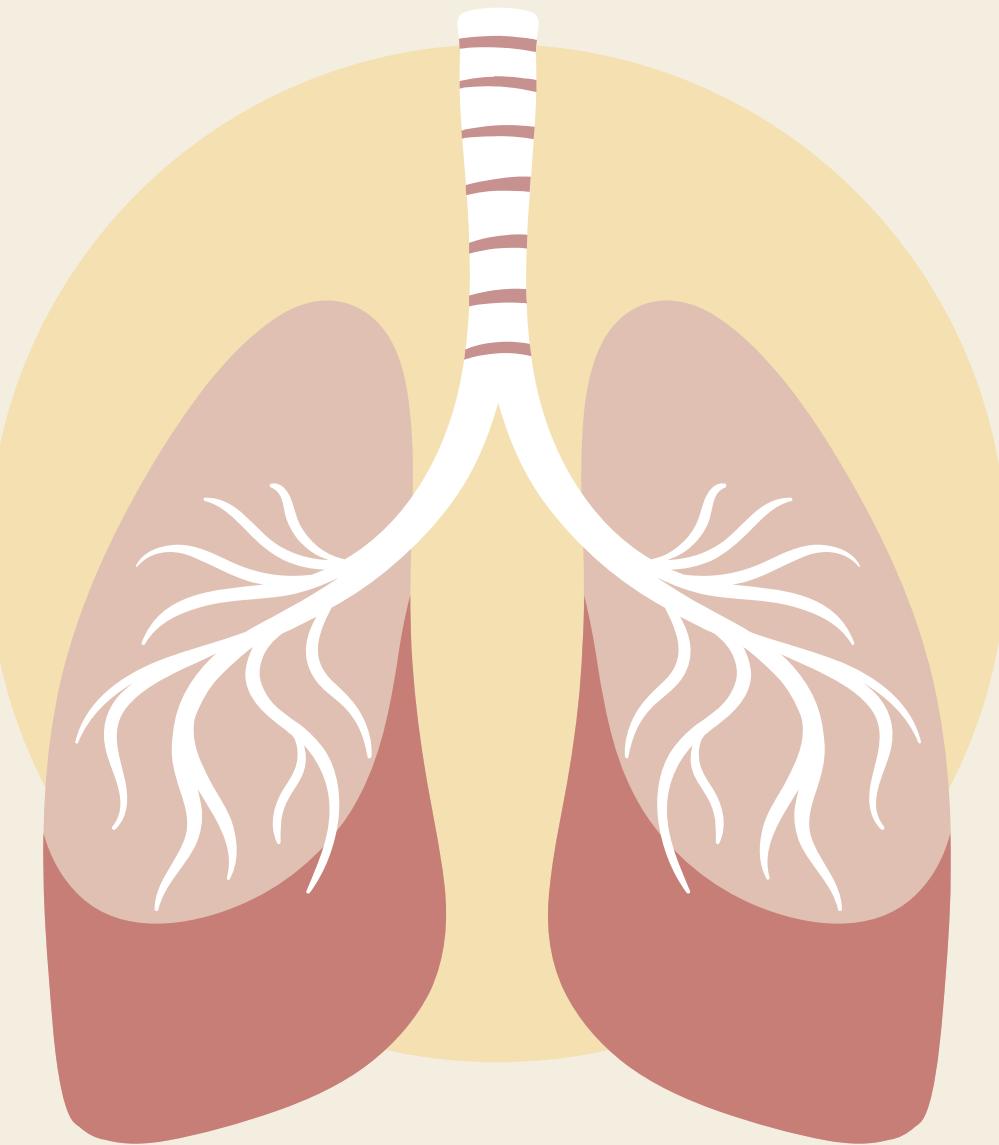
Pneumonia

- 450 million people worldwide contract pneumonia each year.
- In 2019, pneumonia was responsible for the deaths of 740,180 children under the age of five, making it one of the largest infectious cause of death in this age group

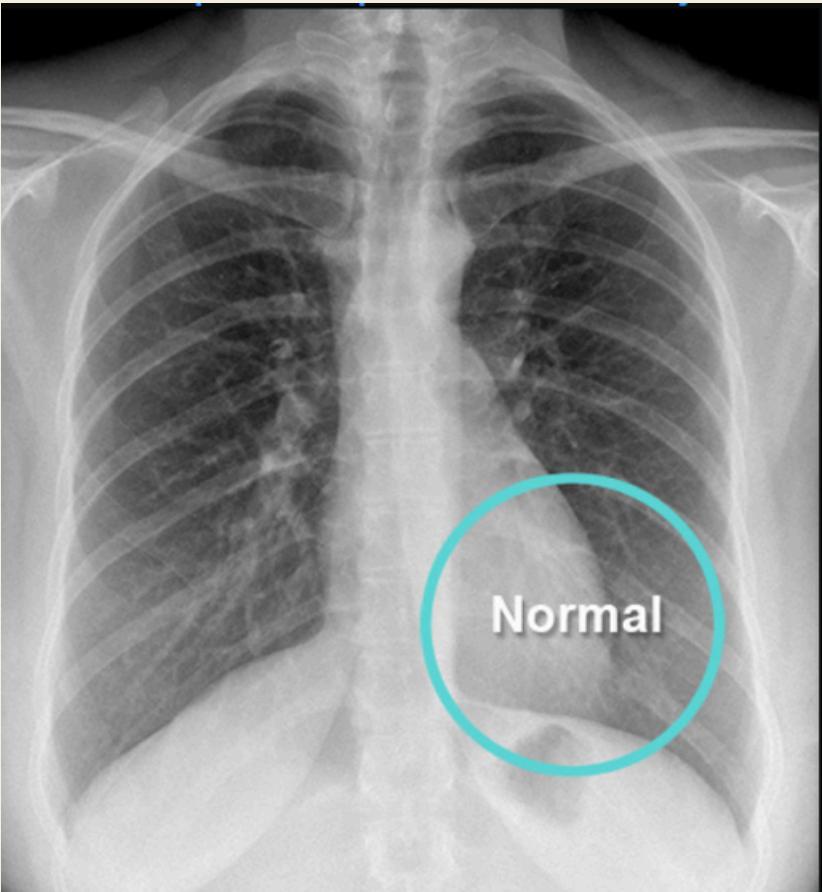


Tuberculosis

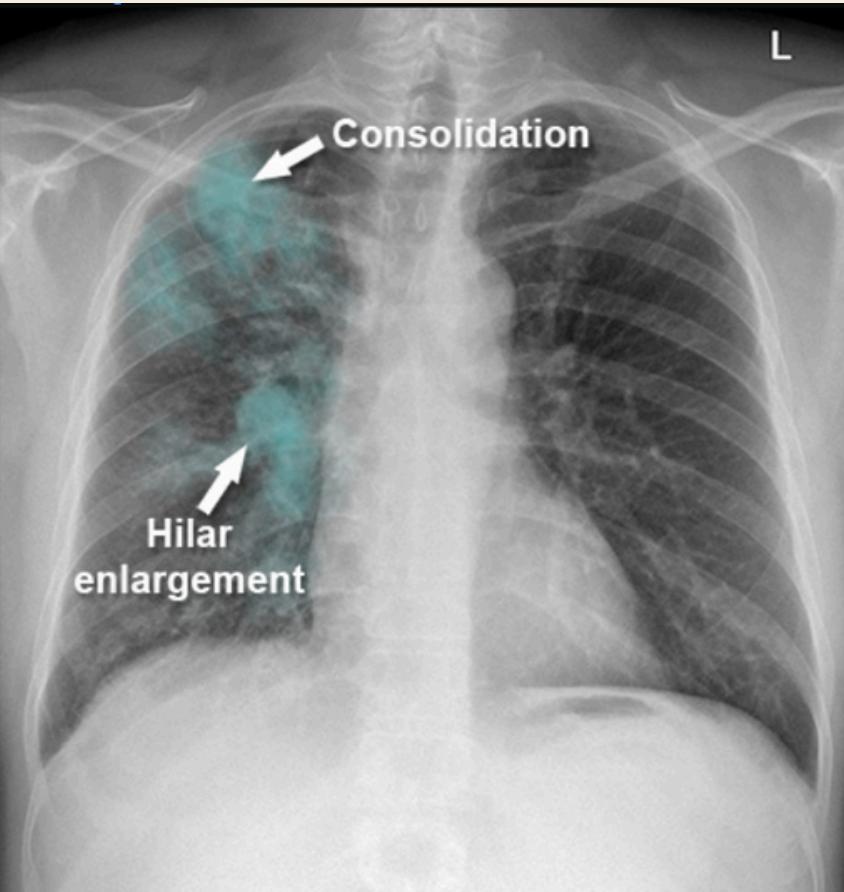
- An estimated 10.8 million people developed TB in 2023, with the highest burdens in South-East Asia (45%).
- Approximately 1.25 million people died from TB in 2023



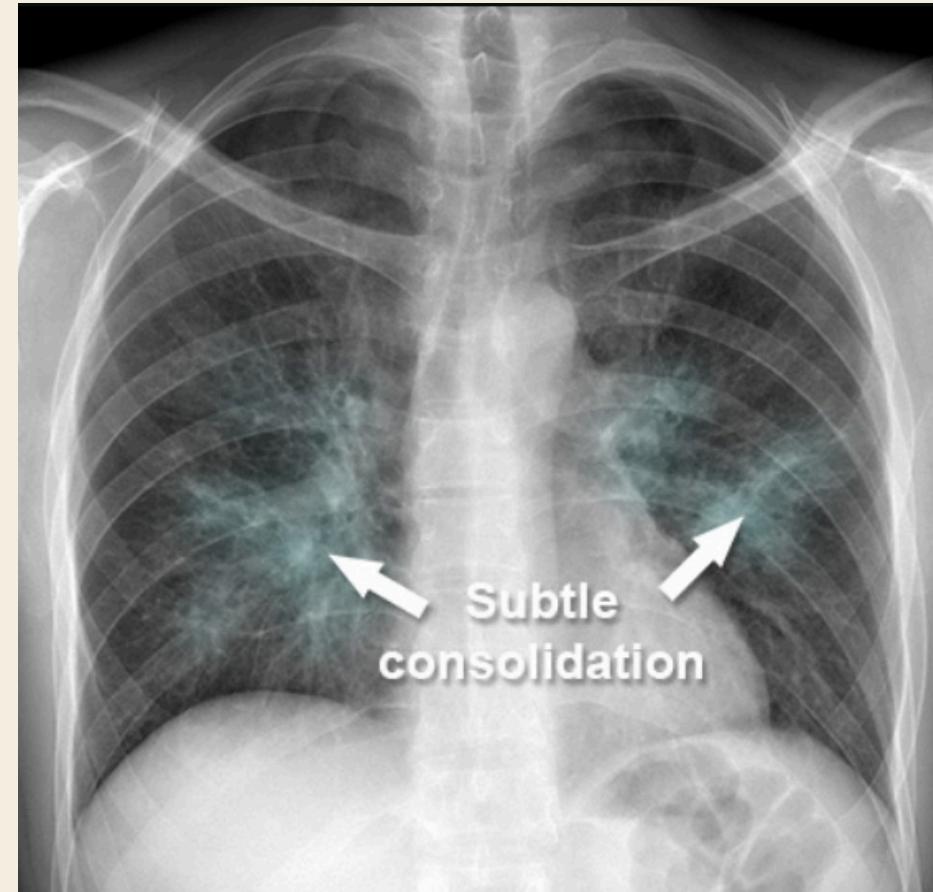
Diagnosis



Normal



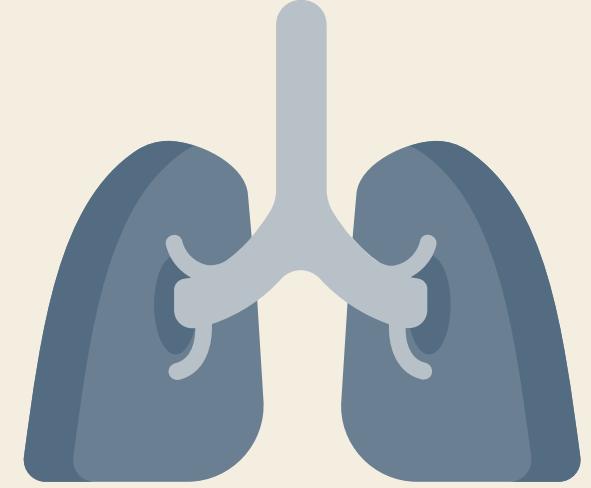
Tuberculosis



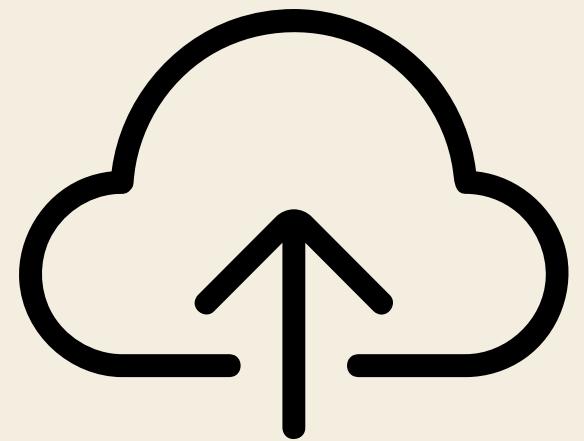
Pneumonia



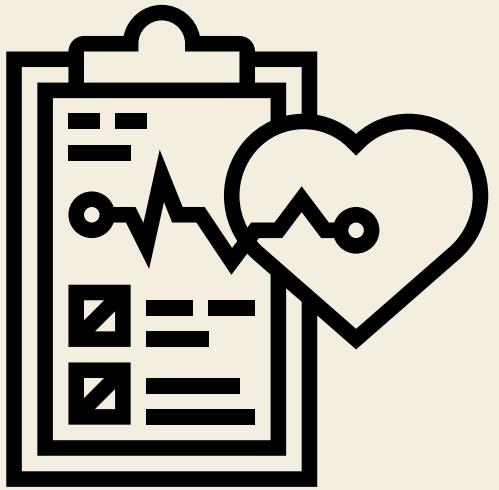
Our Solution



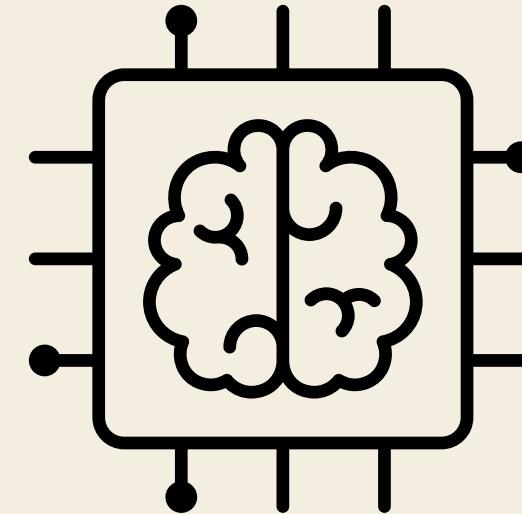
A Fast, Accurate, and Deployable AI Tool for Chest X-ray Diagnosis



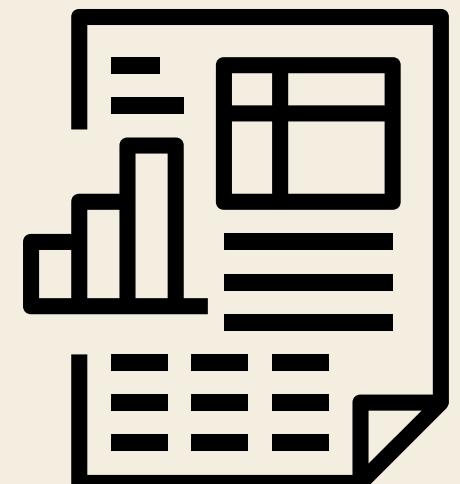
Upload a Chest X-ray



Get an Instant Diagnosis
from Our AI Model



Optionally Query an
external LLM for a Second
Opinion

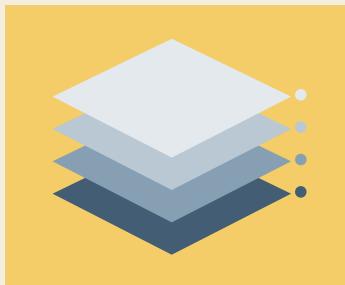


Get a generated
summary

About the model



About the model



Transfer Learning

ResNet 18 with
modification to the final
layer



Class Imbalance

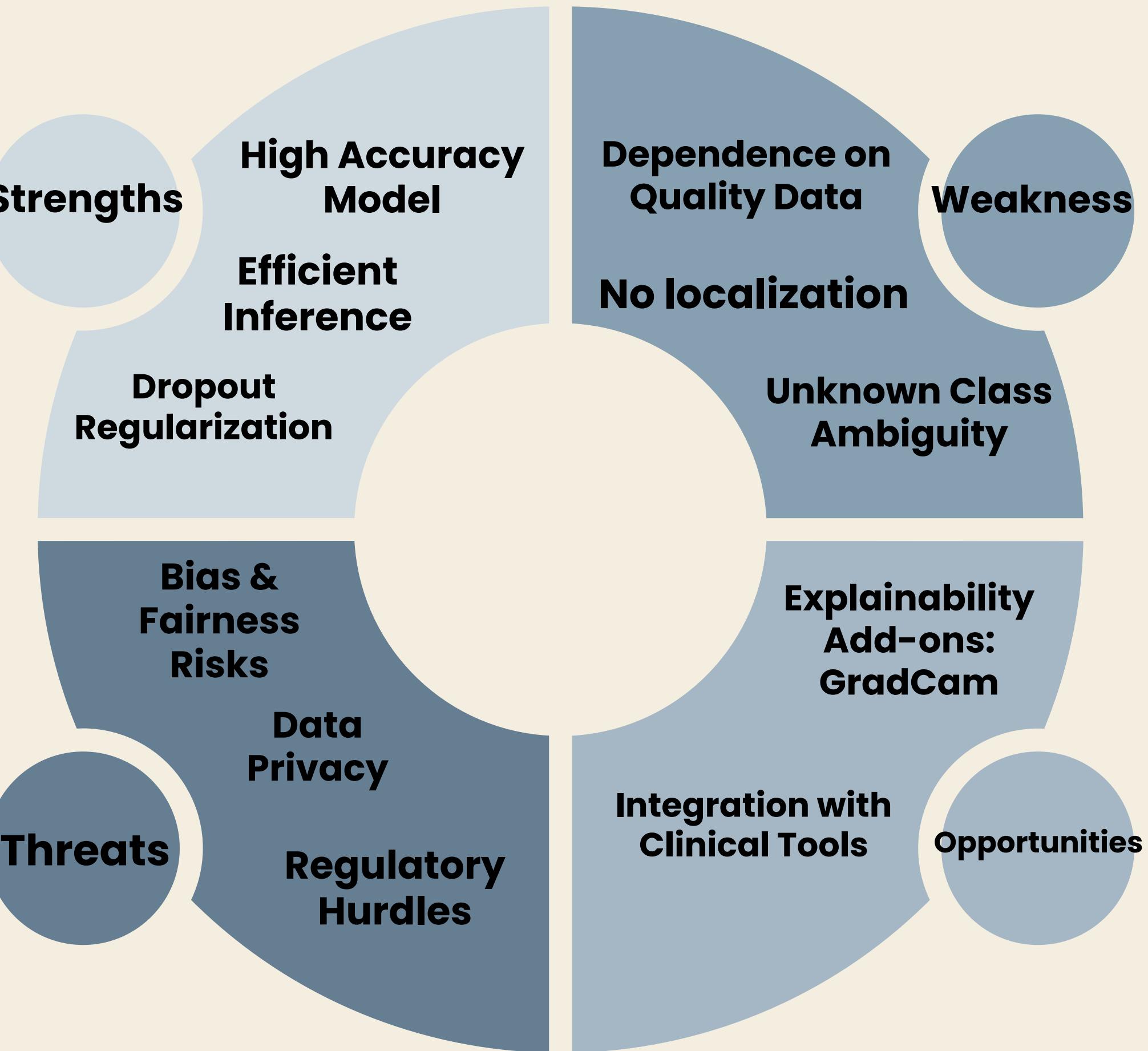
A Weighted Random
Sampler
Took into account Class
Weights



Loss & Optimization

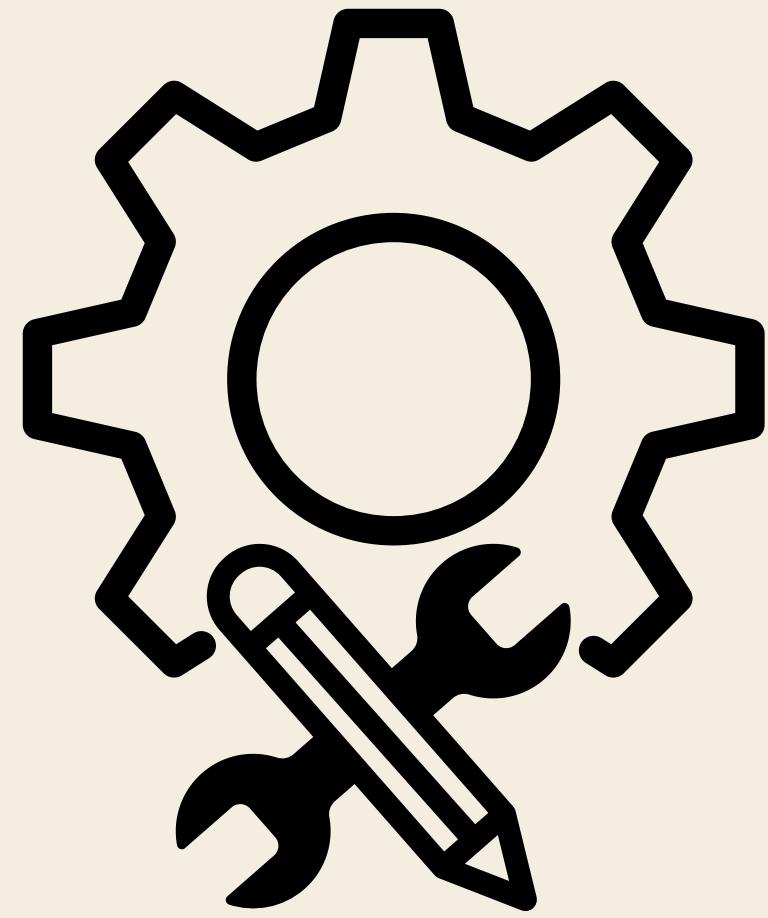
CrossEntropyLoss for
classification.
AdamW for optimization.

SWOT ANALYSIS





The Training Process



Data processing

1

**Dataset gathering and splitting
(80,10,10)**

2

**Clean duplicates and outliers
(Bad Images)**

3

Normalizing the data

4

Data augmentation

5

Ready for training

Normalization applied

- Image format conversion (grayscale).
- Resizing to standard 512x512 pixels.
- Contrast enhancement using CLAHE.
- Normalization using custom dataset statistics (mean and std) from the training set.
- Conversion to .npy format for training.
- Window leveling to adjust brightness

Augmentation applied

- Albumentation with Gaussian Noise
 - Flipping(50%)
 - Rotation($\pm 8^\circ$) and Translation
 - Coarse Dropout (i.e Blackout spots)
 - Random Brightness Contrast(max 15%)

Overfitting Problems



Not enough Data



Too big of a model



Data Augmentation

DEMO

