

# SCANALYZE AI CHEST DISEASE DETECTION

## AUTHORS

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## MOTIVATION

It's late in the ER—patients fill every room, X-rays stack up, and a single radiologist struggles to review scan after scan. Amidst the chaos, subtle signs of critical chest diseases, like pneumonia, risk being overlooked. Delays aren't due to neglect but to overwhelming demand.

What if there was an untiring, ever-watchful assistant helping spot these subtle clues? Our solution: Scanalyze AI, a reliable, deep-learning assistant designed to quickly analyze and detect chest diseases from X-ray images, providing a critical second opinion exactly when it's needed—supporting healthcare professionals and improving patient outcomes.

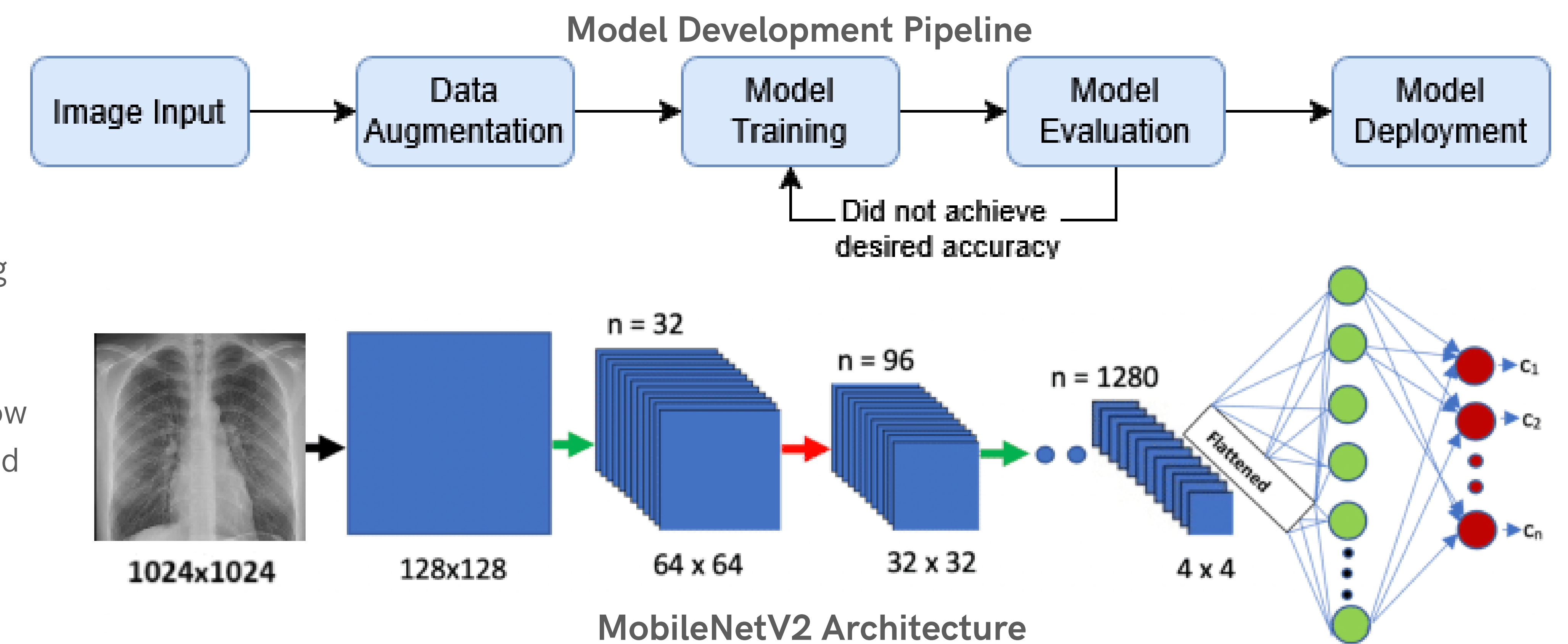
Millions of chest x-rays are done but radiologists are limited and manual interpretation is time-consuming.

## MODEL

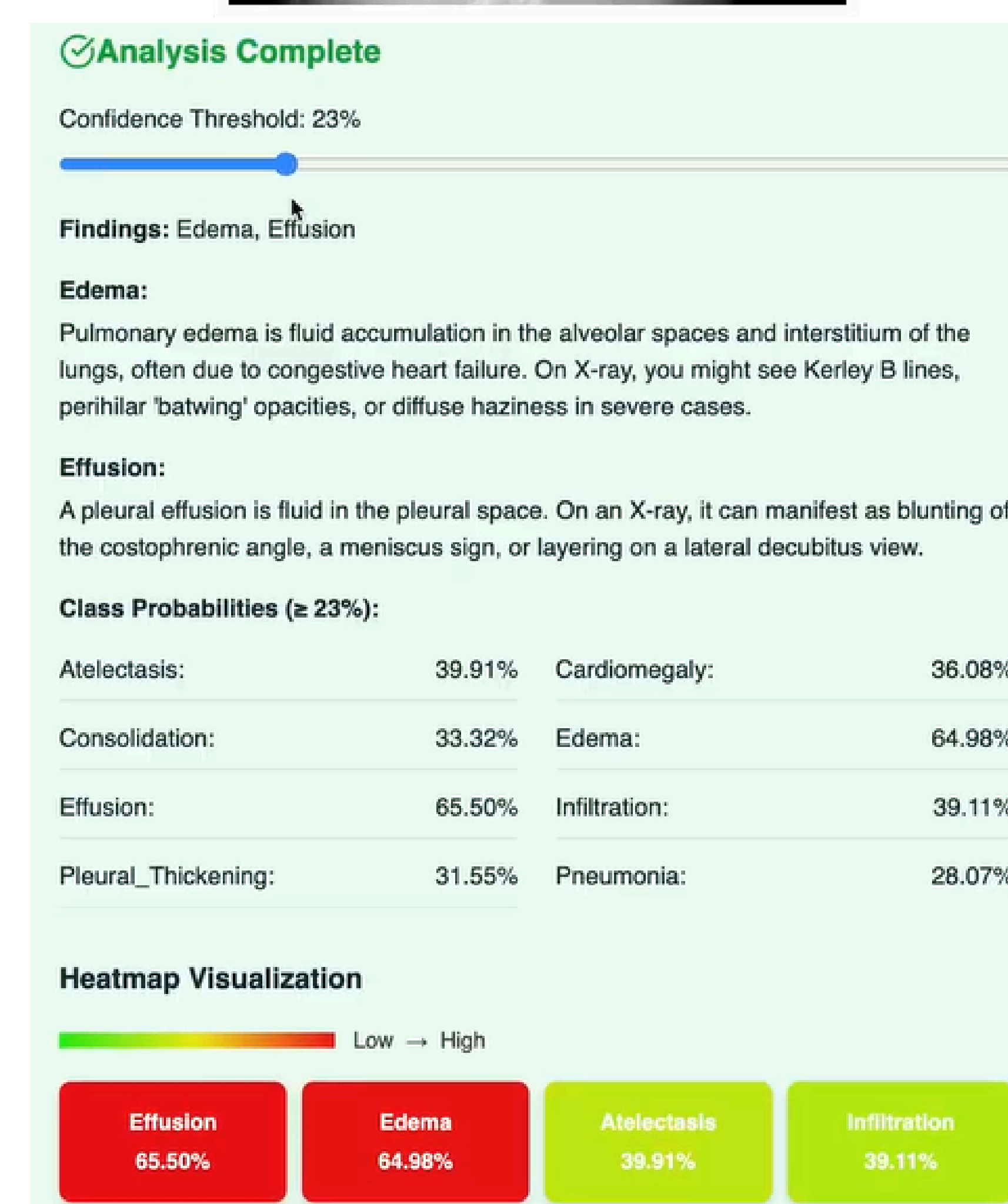
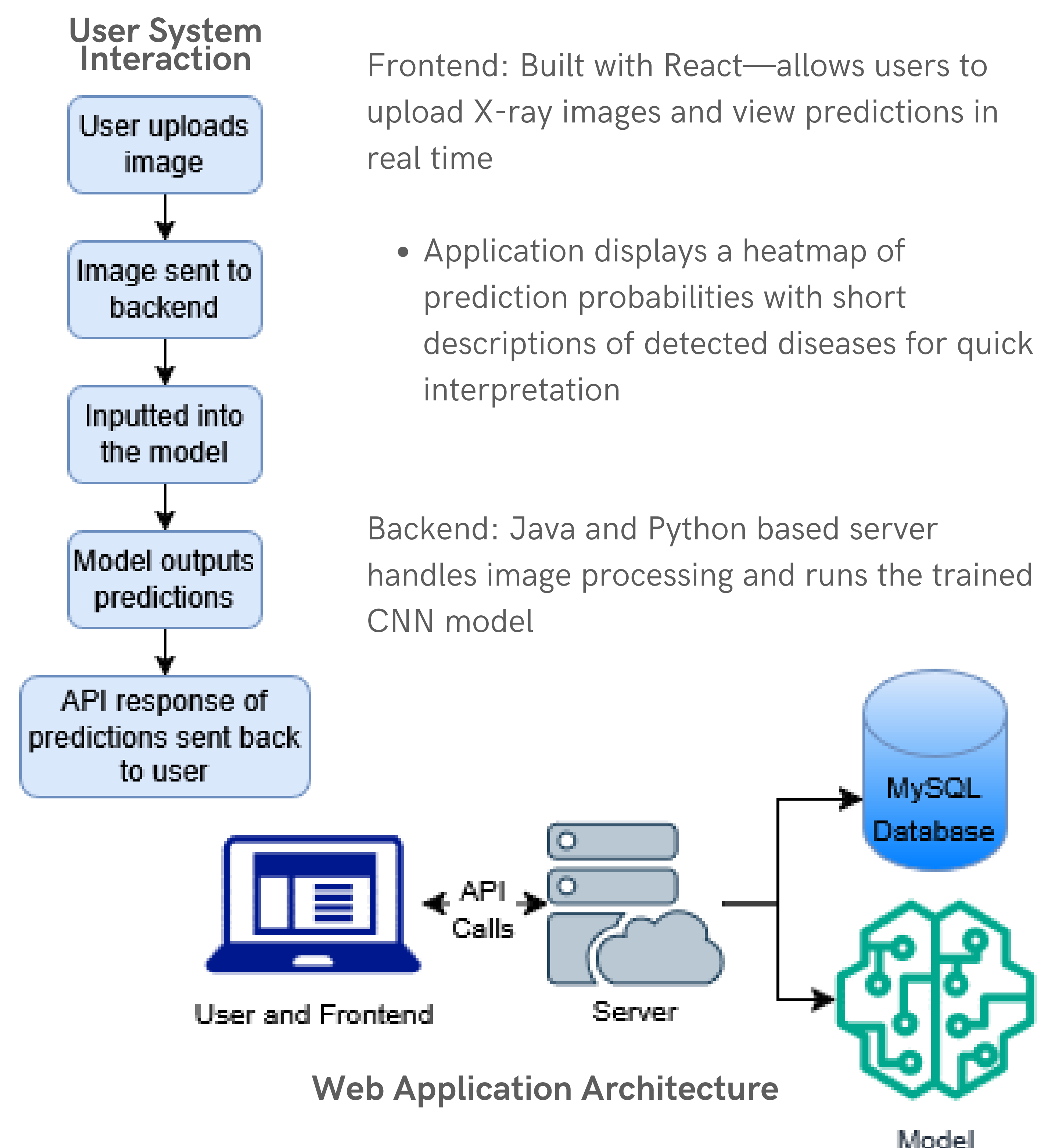
MobileNet architecture, a lightweight CNN efficient for quick real-time inference

Detects 13 chest conditions, including pneumonia and edema

Custom loss function to discourage low confidence, inaccurate predictions and penalize misclassification of rare examples caused by large class imbalances from the dataset



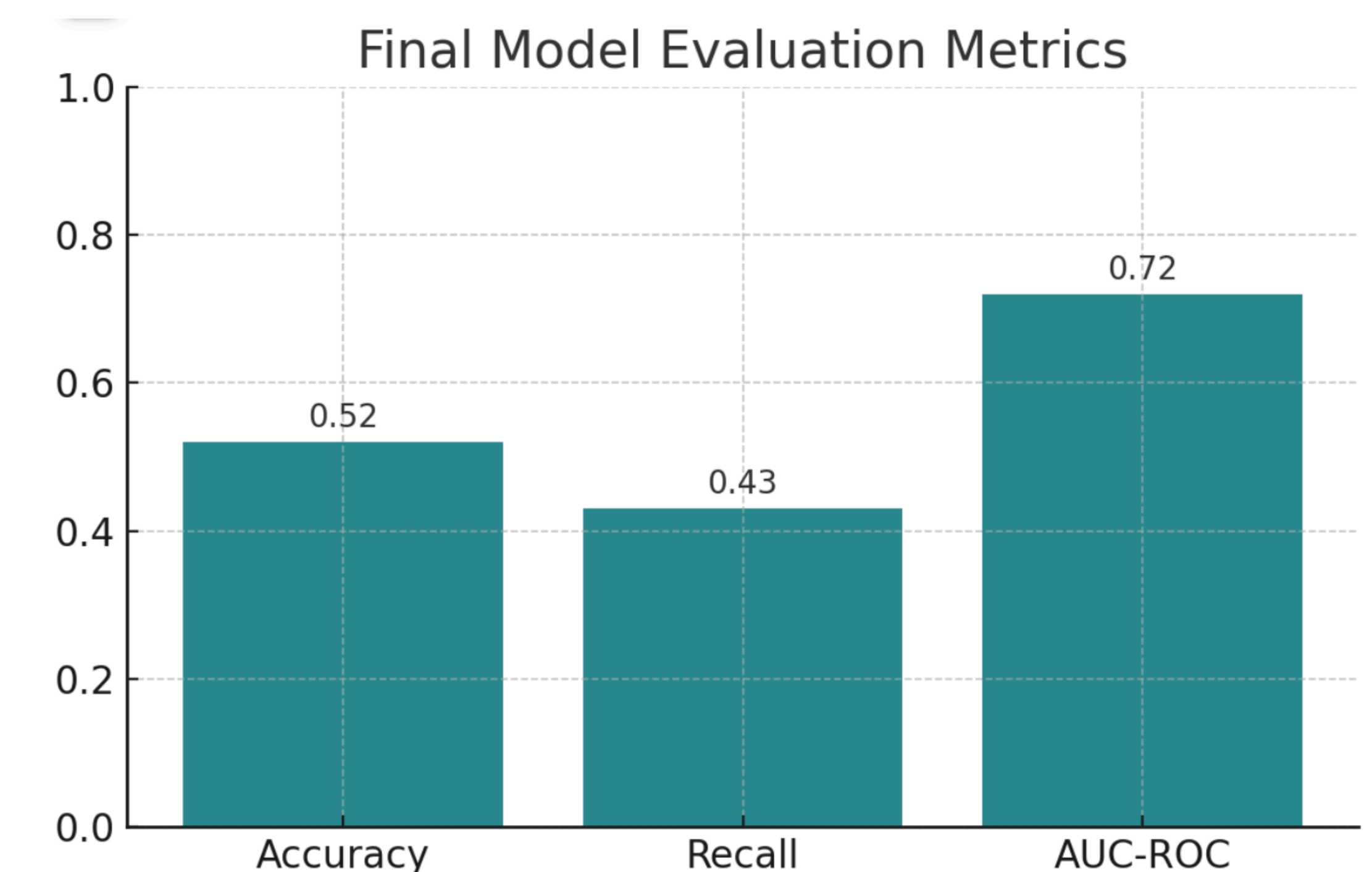
## ENGINEERING OVERVIEW



## RESULTS

The model achieved a recall of 0.43, accuracy of 0.50, and an AUC-ROC of 0.80 across all 13 labels

Predicts in real-time, averaging less than 10ms per image in our tests



## IMPACT

Provides fast, consistent second opinions to assist radiologists and clinicians

Helps reduce diagnostic delays in busy or under-resourced hospitals

Lays the groundwork for scalable, AI-assisted diagnostic tools in real-world clinical workflows

## FUTURE WORK

Combine multiple datasets to improve model performance and generalization

Add localization with bounding boxes to highlight disease regions and aid interpretation

Extend model to other types of X-rays (e.g., abdomen, extremities) for broader coverage

