



Team 8

Efficient X-Ray Representations For Classifying Diseases

UBC Medicine Datathon 2025

BACKGROUND



Chest X-rays are a primary diagnostic tool for identifying thoracic diseases.

KEY CHALLENGES

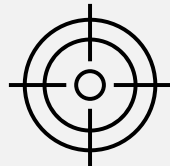


Data Scale

Usable representation

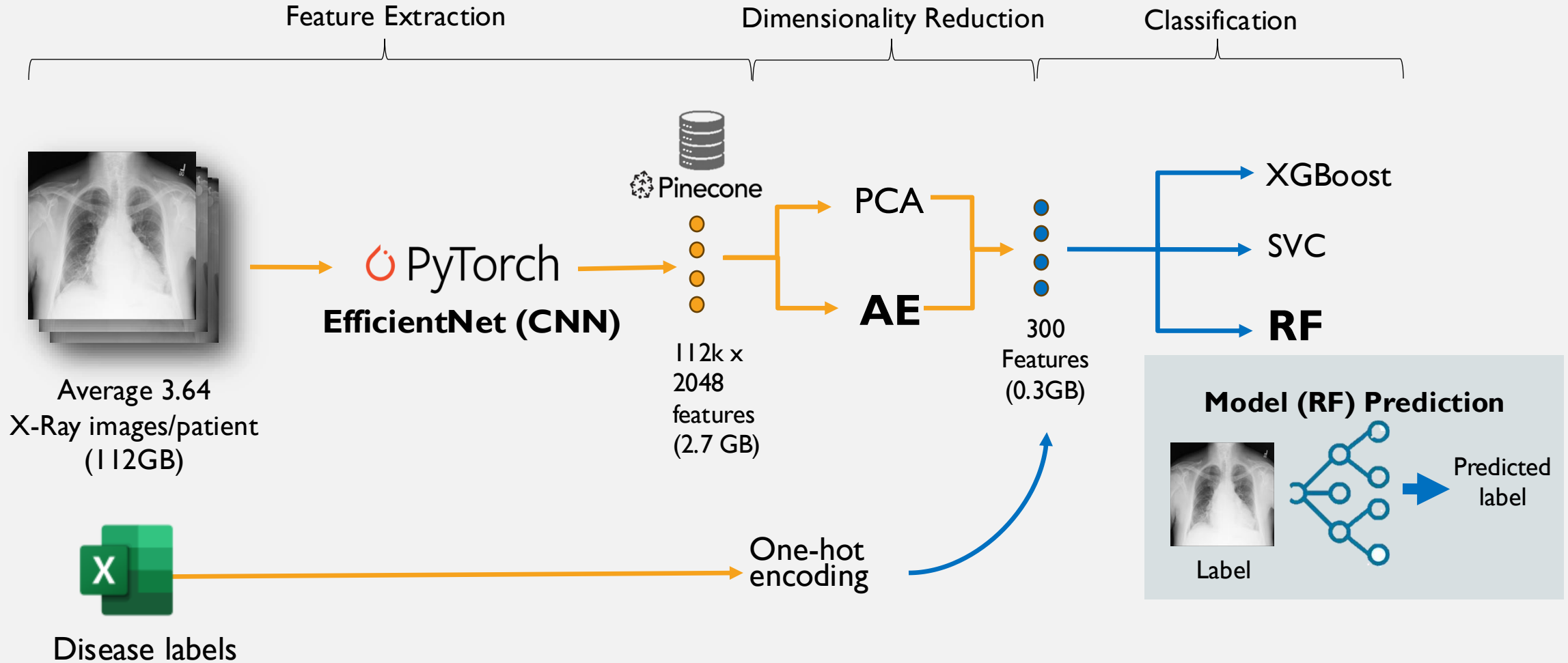
Annotation Constraints

OBJECTIVES



To create an **efficient** and **accurate** representation of x-ray images using a combination of feature extraction and dimensionality reduction

PIPELINE

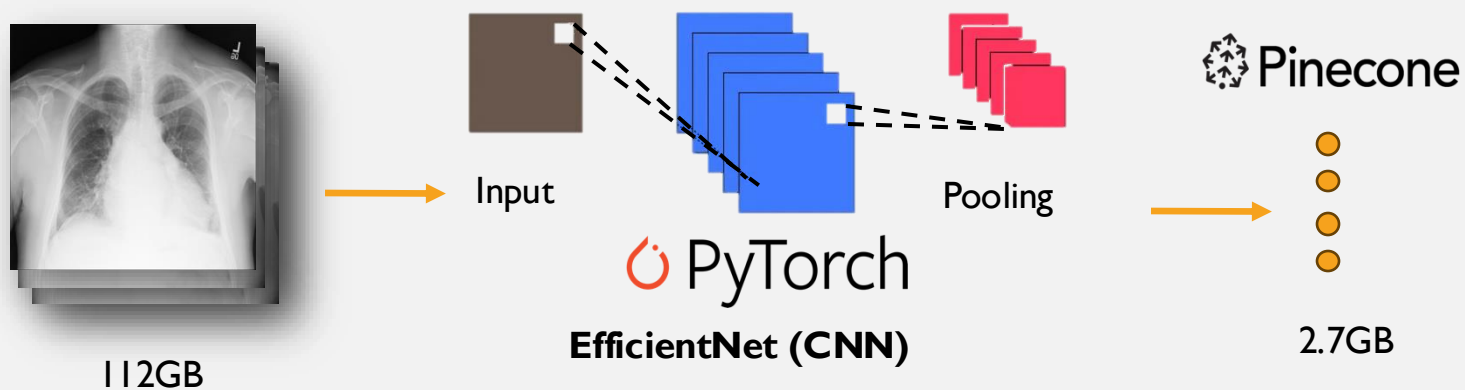


FEATURE EXTRACTION

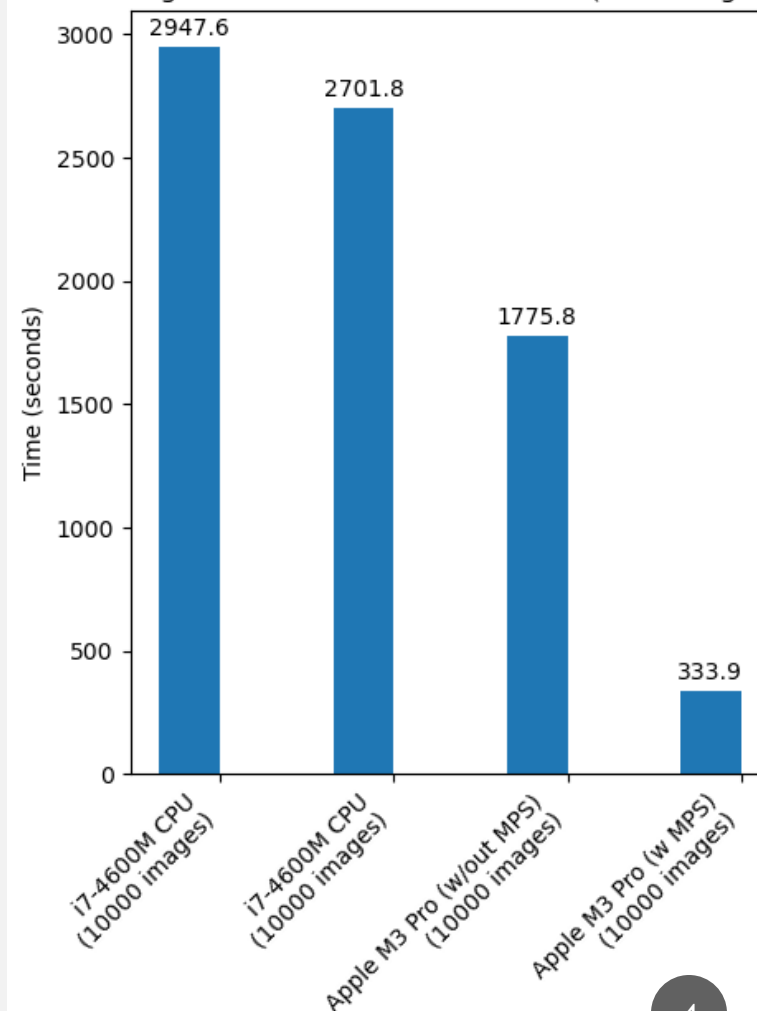
Challenge

Data Scale: 112GB \rightarrow 2.7GB

Reduction: 40x

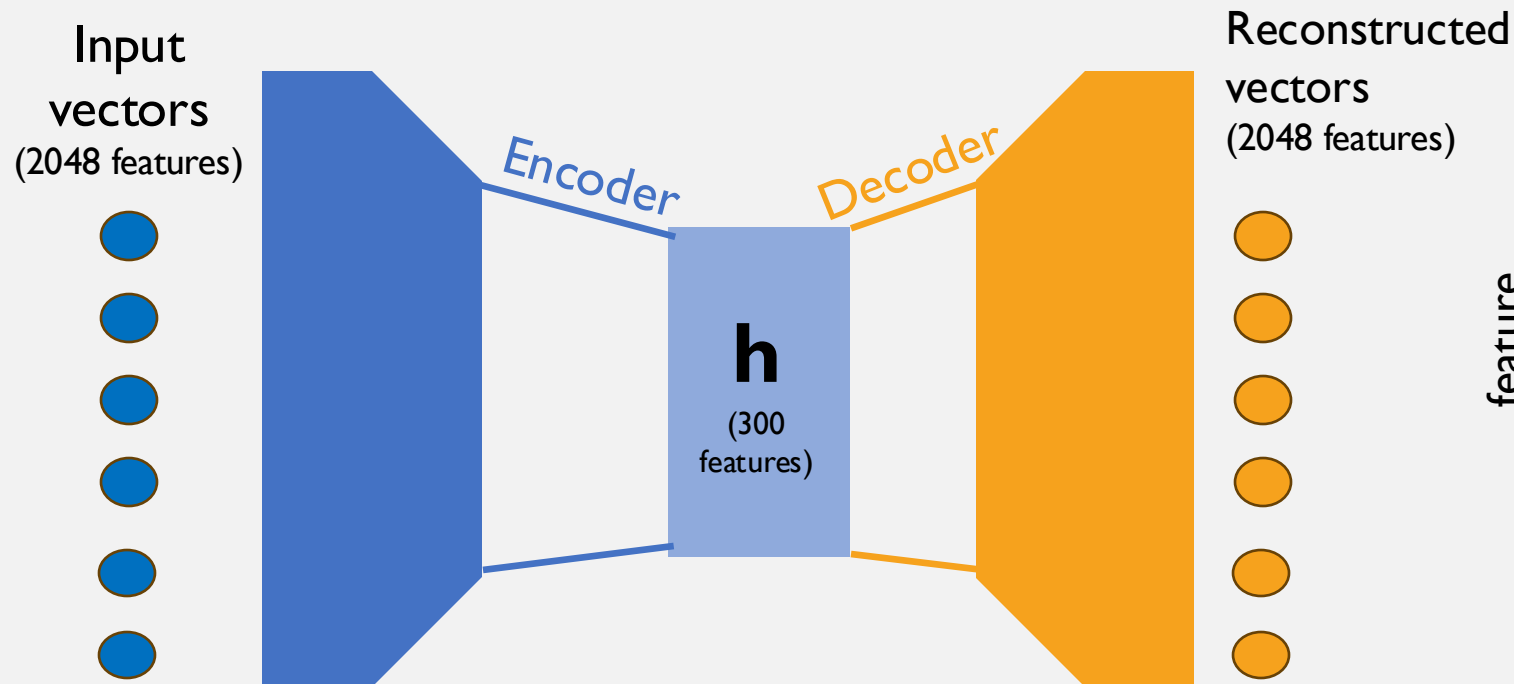


Processing Times For Feature Extraction (with Image Counts)

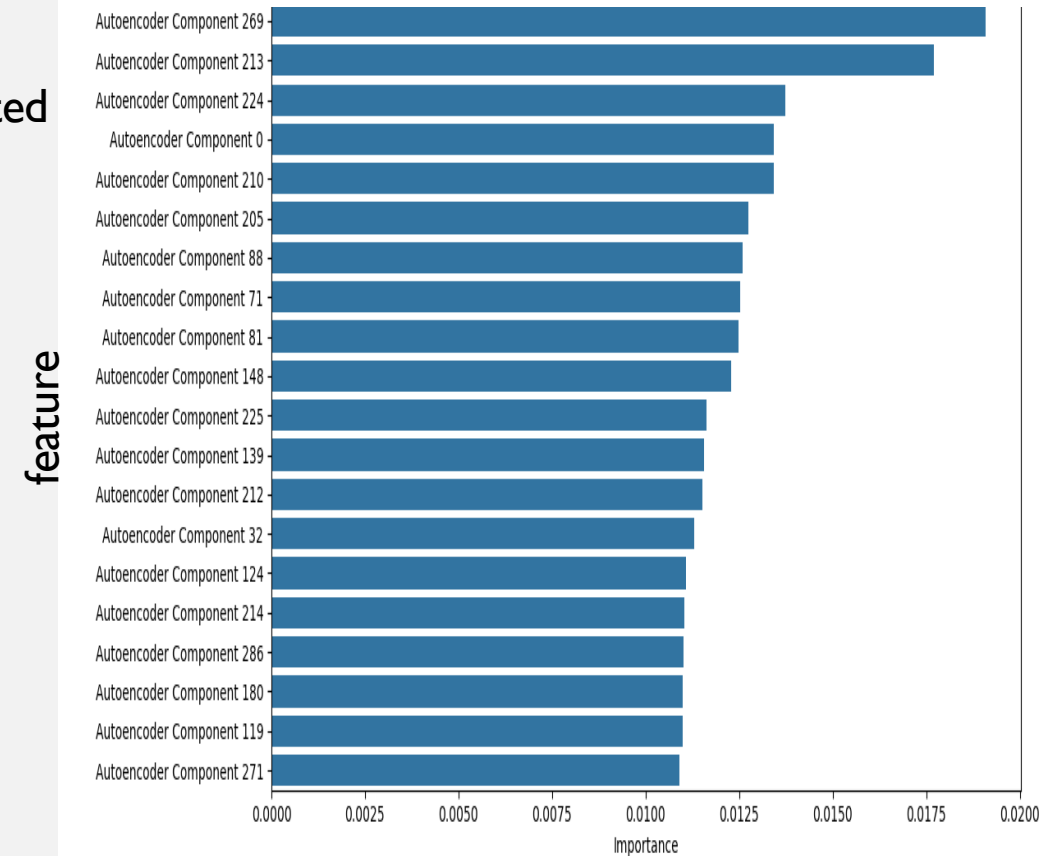


DIMENSIONALITY REDUCTION

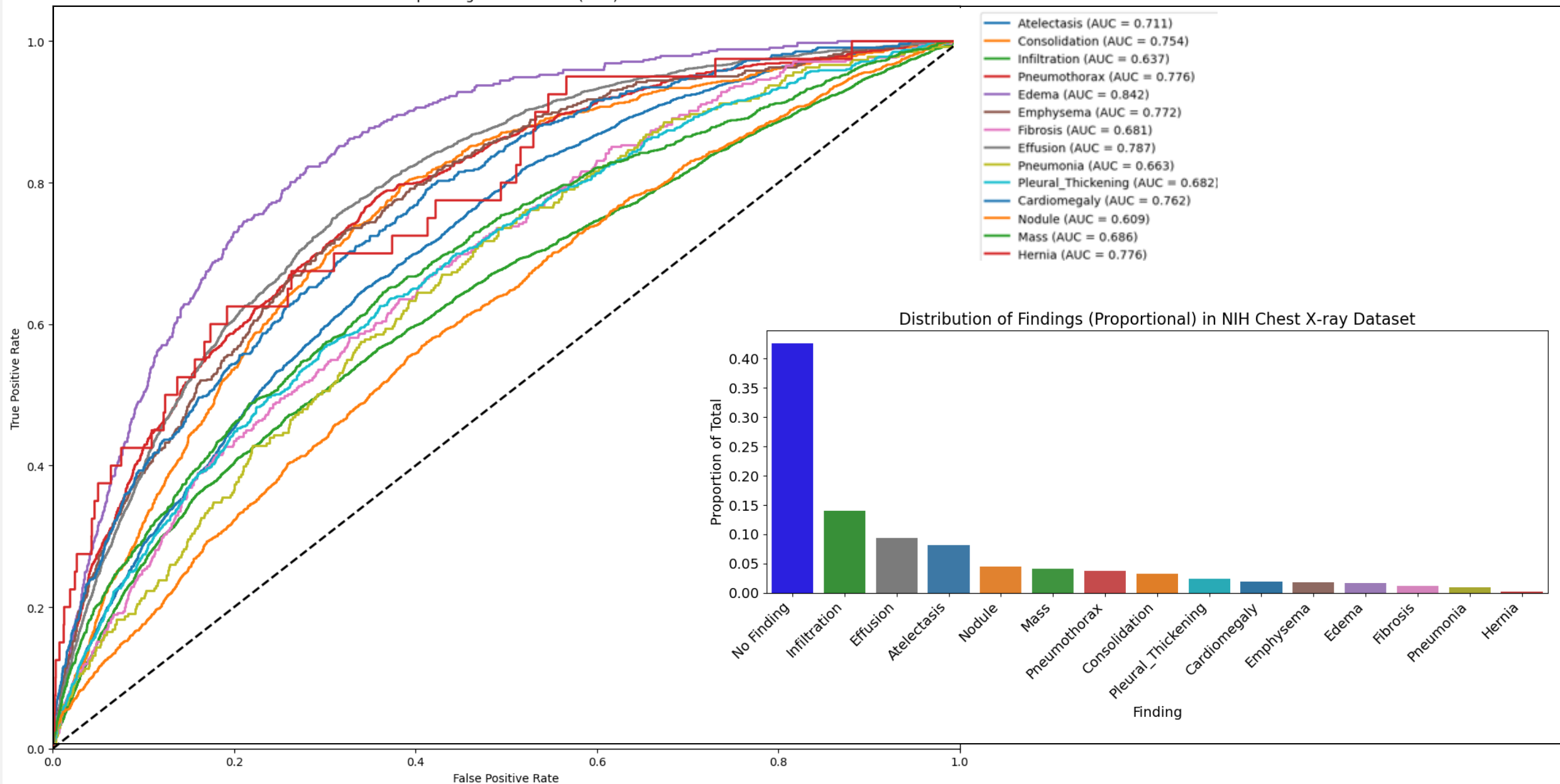
Challenges: Usable Representation



Top 20 autoencoding features



Receiver Operating Characteristic (ROC) Curves

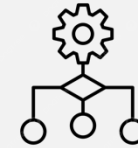


IMPLICATIONS

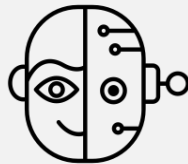
Disclaimer: AIs are not doctors nor do they play them on TV.



Using algorithms to **assist** preliminary decisions



However, there needs to be studies on the complex of human-robot interaction.



Like any other model, the model is vulnerable to concept drift.



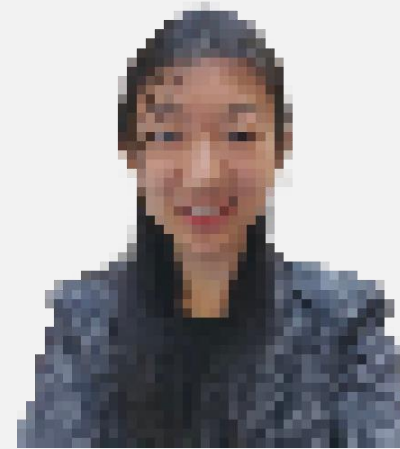
TEAM



Ethan Rajkumar



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Charity Grey



Pushya Jain



Vivaan Jhaveri



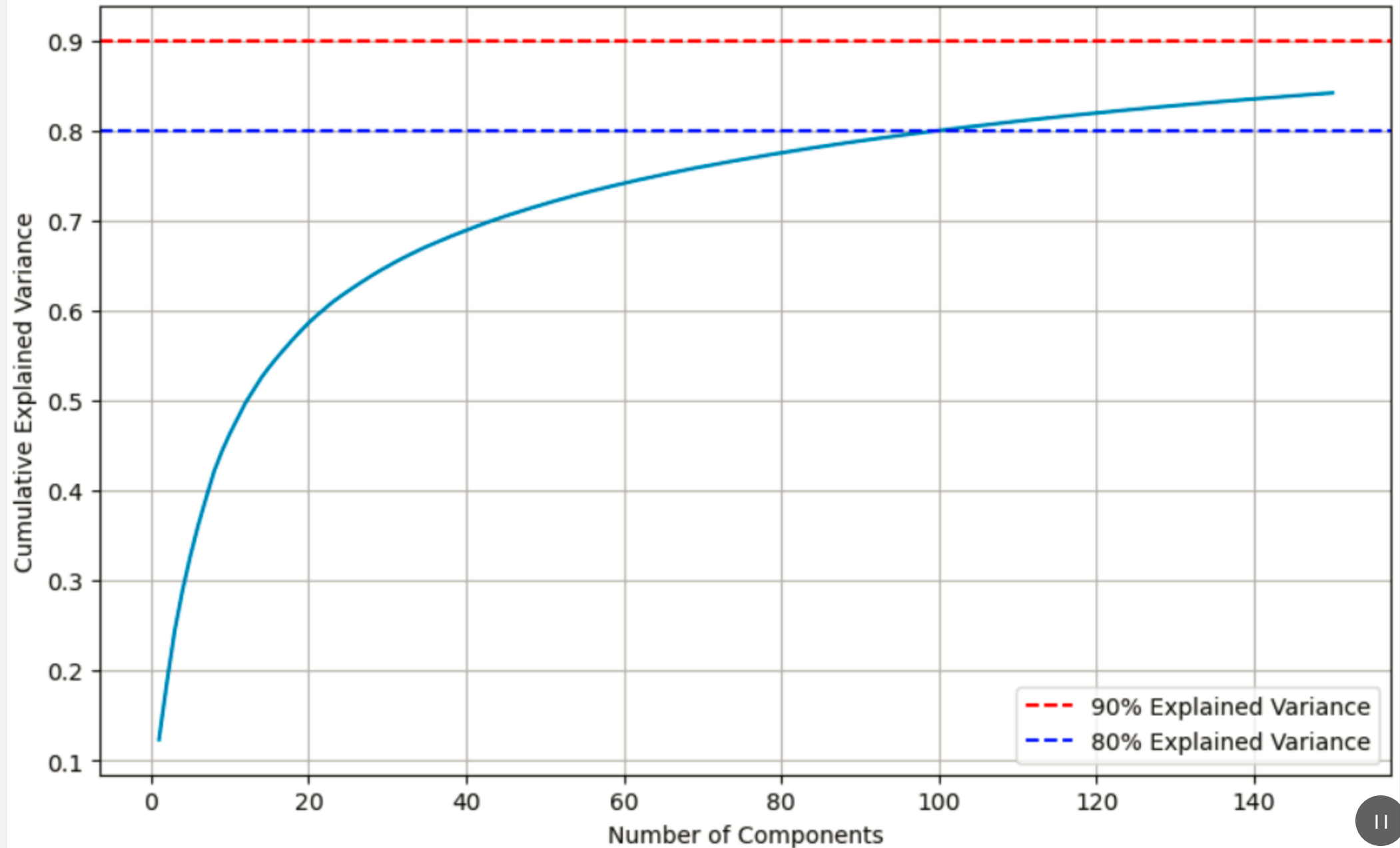
Erhan Javed

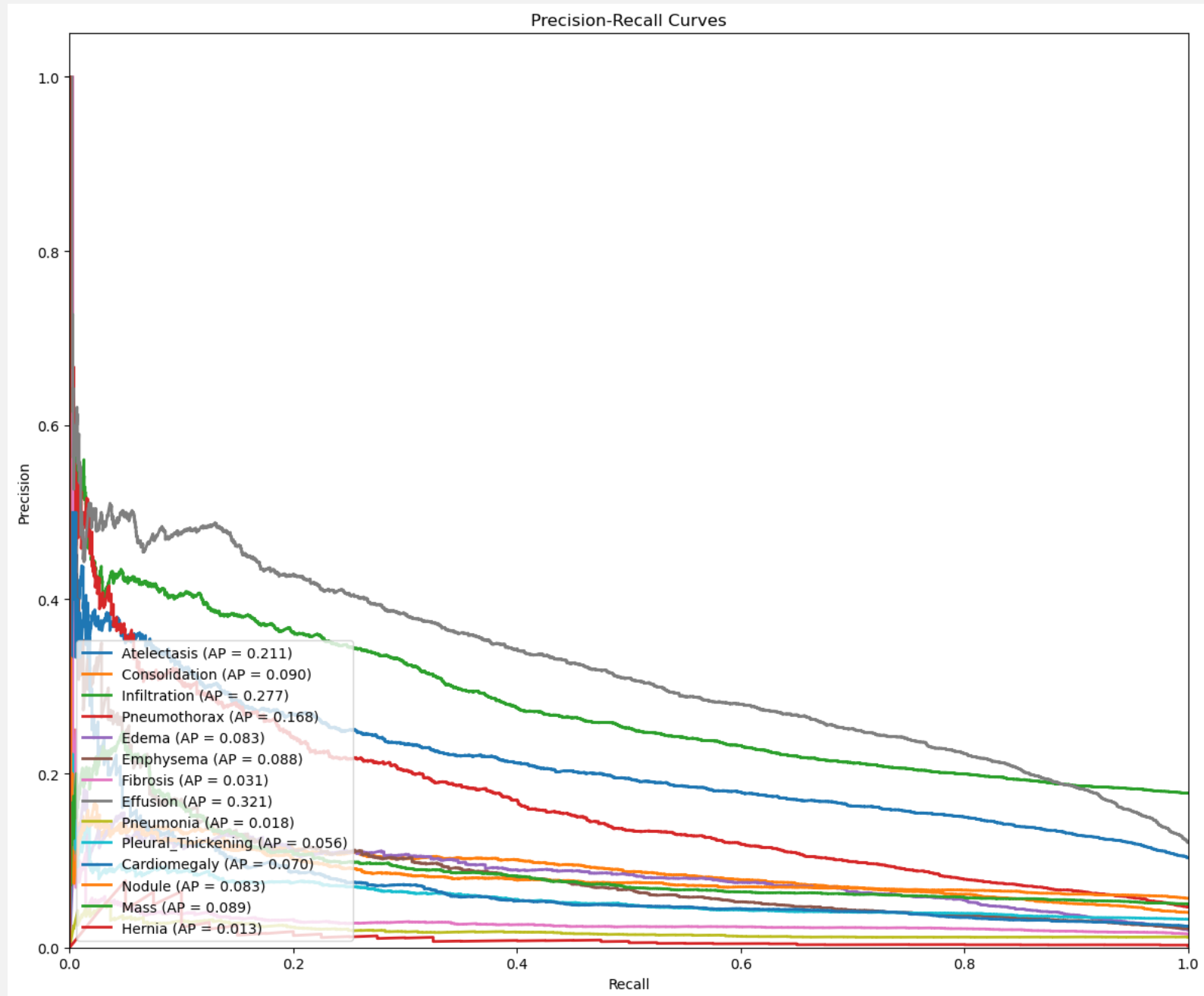
REFERENCES

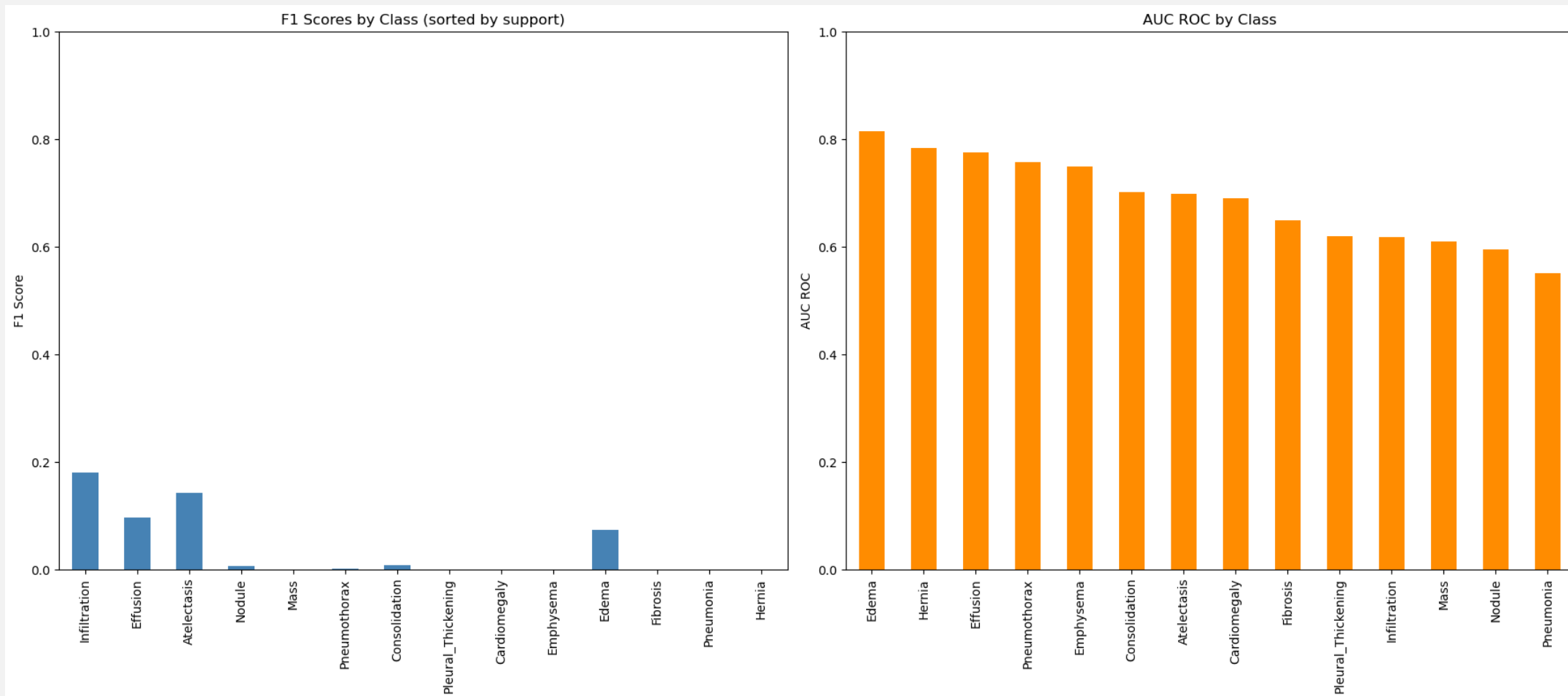
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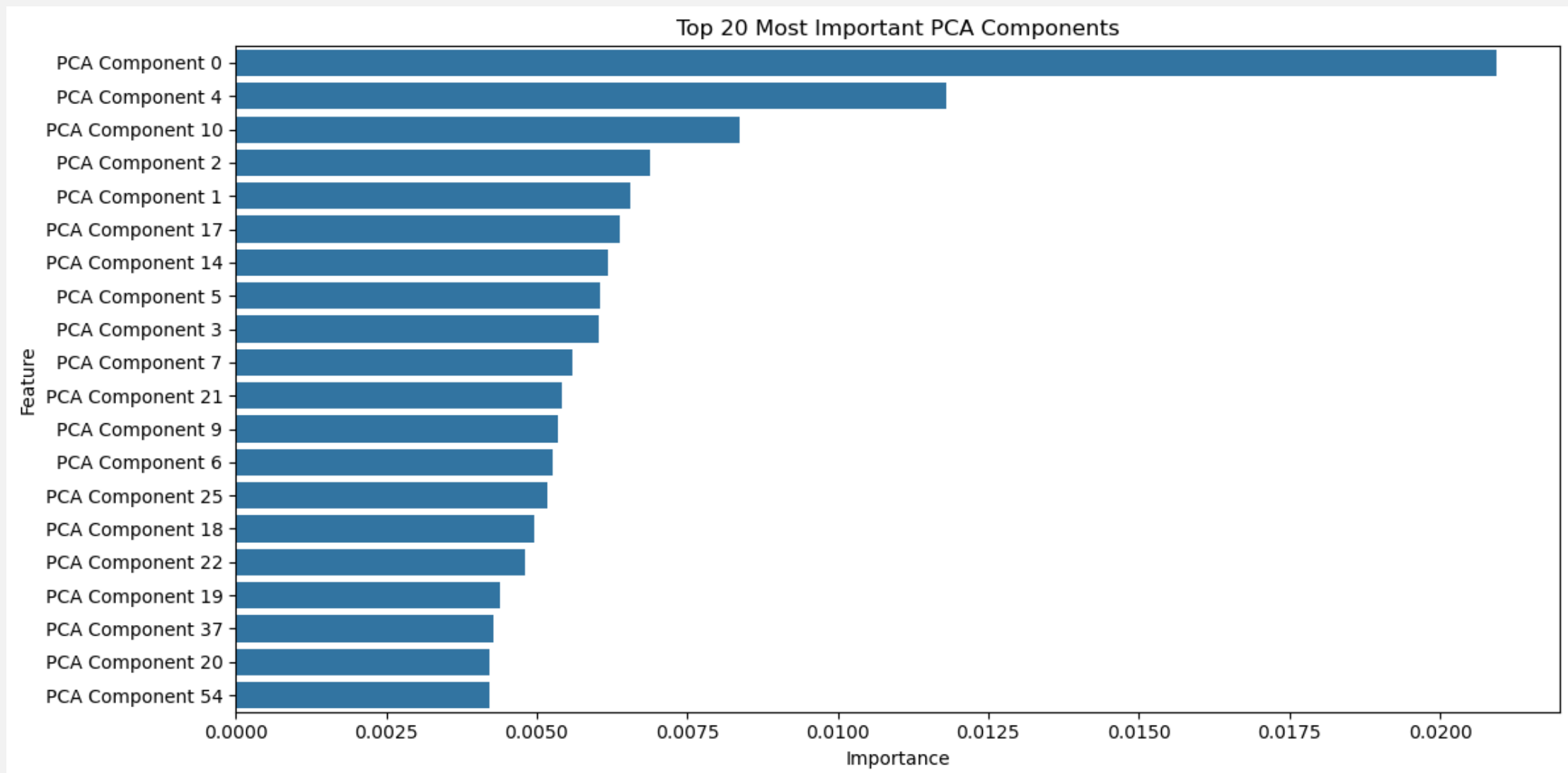
APPENDIX

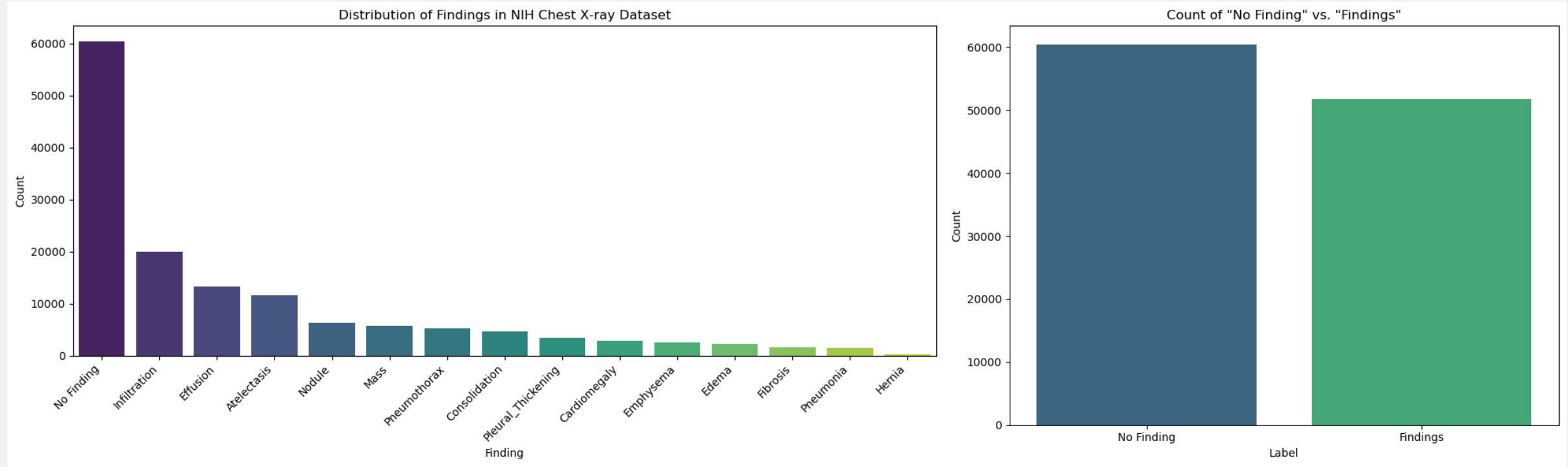
Explained Variance vs. Number of Components











RANDOM FOREST

SVC → bad ROC score < 50%

Gradient boosted → slow

Random Forest → best

RESULTS- TYPES OF DISEASE

