Computer Vision for Chest Radiograph Interpretation

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# Abstract

We investigate different approaches to using the uncertainty labels for training convolutional neural networks that output the probability of these observations given the available frontal and lateral radiographs. On a validation set of 200 chest radiographic studies which were manually annotated by 3 board-certified radiologists, we find that different uncertainty approaches are useful for different pathologies. We then evaluate our best model on a test set composed of 500 chest radiographic studies annotated by a consensus of 5 board-certified radiologists, and compare the performance of our model to that of 3 additional radiologists in the detection of 5 selected pathologies. On Cardiomegaly, Edema, and Pleural Effusion, the model ROC and PR curves lie above all 3 radiologist operating points. We release the dataset to the public as a standard benchmark to evaluate performance of chest radiograph interpretation models.

# Introduction

Chest radiography is the most common medical imaging examination globally1. Computer-aided interpretation can …

This work uses the ChExpert dataset2 compiled by Stanford University to train and validate our models.

# Dataset

The dataset consists of 224,316 chest radiographs of 65,240 patients. The radiographs are labeled for the presence of 14 different types observations, with three distinct types of labels: ‘positive’, ‘negative’, and ‘uncertain’. The prevalence of each of the labels for each observation is noted in Table 1.

A close-up of a paper

Description automatically generated with low confidence

Include some points to note about the dataset…

1. Images are differently sized
2. Includes frontal and lateral views
3. Please feel free to include

# Modelling

## Literature Review

Review some past modelling and feature engineering approaches.

## Feature Engineering

## Dealing with the ‘Uncertain’ label

## Modelling approach

# Results

# Discussion

# Conclusion

# Bibliography