Class Specific Feature Disentanglement and Text Embeddings for Multi-label Generalized Zero Shot CXR Classification

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Abstract. Robustness of medical image classification models is limited by its exposure to the candidate disease classes. Generalized zero shot learning (GZSL) aims at correctly predicting seen and unseen classes and most current GZSL approaches have focused on the single label case. It is common for chest x-rays to be labelled with multiple disease classes. We propose a novel multi-label GZSL approach using: 1) class specific feature disentanglement and 2) semantic relationship between disease labels distilled from BERT models pre-trained on biomedical literature. We learn a dictionary from distilled text embeddings, and leverage them to synthesize feature vectors that are representative of multi-label samples. Compared to existing methods, our approach does not require class attribute vectors, which are an essential part of GZSL methods for natural images but are not available for medical images. Our approach outperforms state of the art GZSL methods for chest xray images.

Keywords: Multi-label · GZSL · Text Embeddings · chest x-rays · feature synthesis

1 Introduction

Deep learning methods provide state-of-the-art (SOTA) performance for a variety of medical image analysis tasks such as diabetic retinopathy grading [7], and

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