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Al-Healthcare Bridge: A Balance Between Prediction and Interpretation

Abstract: Healthcare industry is experiencing a new era where computational tools and machine intelligence are converging with human intelligence. One of the main goals of this new era is to construct a new Health Index integrating many different data modalities, from structured data such as imaging and genomic data to unstructured clinical reports. While a major part of the modern machine learning literature focuses on prediction, the adoption of the new approaches has been slow in the biomedical and clinical research communities due to the lack of interpretability. To bridge this gap, one should strike a balance between prediction and interpretation. In this talk, we discuss a deep learning-based discriminative method to construct high dimensional phenotype from CT images to study Chronic Obstructive Pulmonary Disease (COPD). We show how a parallel generative model can be used to interpret the trained discriminative model. This general strategy can be employed to integrate other biomedical data; an interesting future research direction that will be discussed briefly.