

AI-Healthcare Bridge: A Balance Between Prediction and Interpretation

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Healthcare: data driven. Imaging, genomic -→ readable clinical reports.

Machine learning challenge: tasks limited

Classification, prediction, transfer learning and meta learning is difficult. Lack of interpretation.

To bridge the gap between classification and interpretability.

Use CT images to study chronic disease COPD

Discriminative model vs. generative model

Create high-dimension phenotype/feature embedding from CT images.

Subject2vec:

Use local image features to a subject level to predict disease severity.

Variable input selection (a set of image patch)

Discriminative model learns fixed-length embedding of local features and maps to disease condition

Attention model provides interpretability by focusing on specific areas.

Generative network on local latent features.

Difficulties: objective function, model architecture, training.

Need to minimize the loss all together. use synthetic data