



Summer Internship 2024

<<Interpret-CXR >>



Team members:

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Summary

GPT2 + Swin

Language model was prepared by finetuning GPT2.

Both the Models were trained to 3 Epochs going over that increased val loss

Swin Transformer was used as a vision encoder

The vision model was mapped to the Findings Language Model

BioBert + CLIP

CLIP model to encode images into feature vectors.

BioBERT model to encode text reports.

Combine image embeddings from CLIP with text embeddings from BioBERT.

Adam Optimizer

GPT2 + Swin

No reports were generated for some test cases

Illegible wordings in the report.

Model had hallucinations.

Low Bleu and Bert Scores

BLEU 1: 0.10746357953276717

BLEU 2: 0.07574067047058278

BLEU 3: 0.05701758764382943

Avg BERTscore: 0.3675421178340912

BioBert + CLIP

Report Generated for all test cases

Reduced occurrence of illegible wordings

Relatively Less Hallucinations

Improved Bleu and bert score

BLEU 1: 0.3838203621573054

BLEU 2: 0.27315239293567217

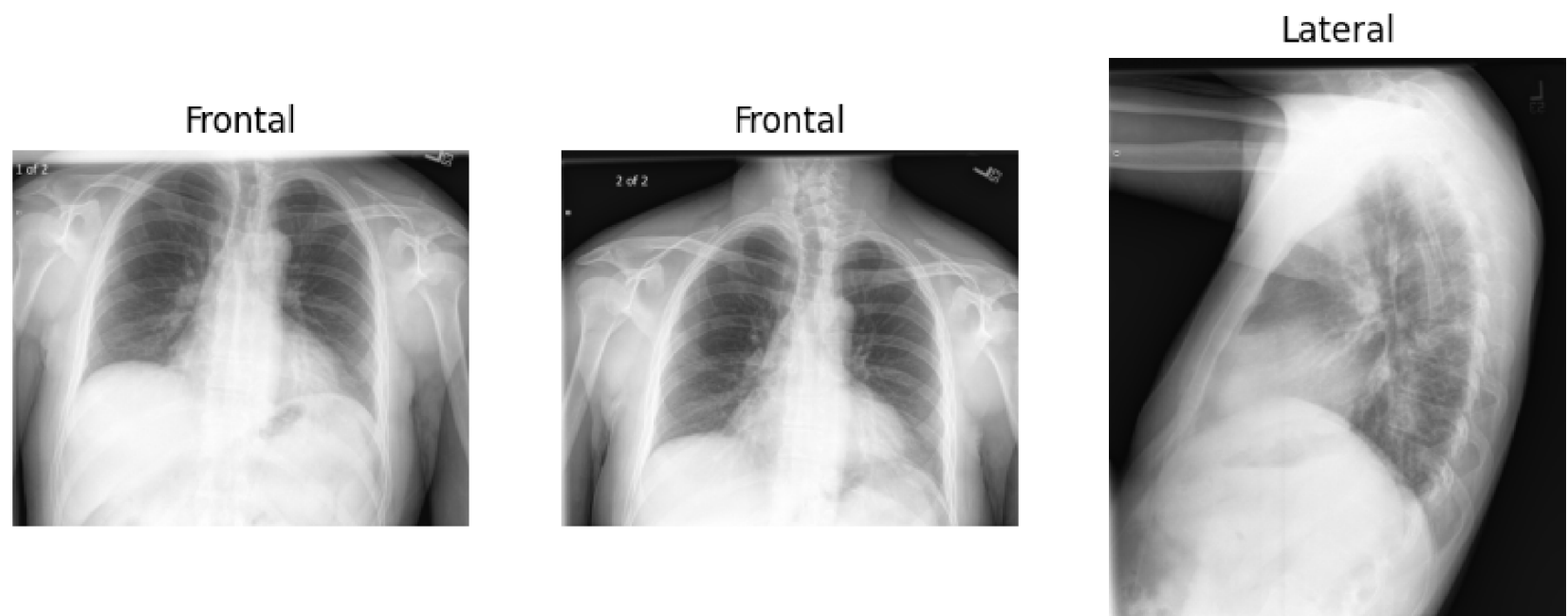
BLEU 3: 0.2386401005878192

Avg BERTscore: 0.7781609253255193

Example Report Generation

GPT2 + Swin

Patient UID: 261



Findings: No focal areas of consolidation. Heart size within normal limits. No pleural effusions. No evidence of pneumothorax. Osseous structures appear intact.
Generated Report: XXXX XXXX representing the XXXX XXXX are present. The heart size and pulmonary vascularity appear within normal limits. The lungs are free of focal airspace disease. No pleural effusion or pneumothorax is seen.

BioBert + CLIP

Patient UID: 261

Frontal



Frontal



Lateral



Findings: No focal areas of consolidation. Heart size within normal limits. No pleural effusions. No evidence of pneumothorax. Osseous structures appear intact.

Generated Report: pa and lateral views of the chest provided. there is no focal consolidation, effusion, or pneumothorax. the cardiomedastinal silhouette is normal. imaged osseous structures are intact. no free air below the right hemidiaphragm is seen.

Example Report Generation

GPT2 + Swin

```
J: compare_report(np.random.choice(test_uids))
```

Patient UID: 2099

Frontal



Lateral



Findings: The lungs are clear bilaterally. Specifically, no evidence of focal consolidation, pneumothorax, or pleural effusion.. Cardio mediastinal silhouette is unremarkable. Visualized osseous structures of the thorax are without acute abnormality.

Generated Report:

BioBert + CLIP

```
251: compare_report(2099)
```

Patient UID: 2099

Frontal



Lateral



Findings: The lungs are clear bilaterally. Specifically, no evidence of focal consolidation, pneumothorax, or pleural effusion.. Cardio mediastinal silhouette is unremarkable. Visualized osseous structures of the thorax are without acute abnormality.
Generated Report: the lungs are clear. there is no pneumothorax. the heart and mediastinum are within normal limits. regional bones and soft tissues are unremarkable.

THANK YOU