The Challenge of Automated Chest X-ray Report Generation

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Radiologists face a growing workload with increasing demand for chest X-ray interpretation.

Manual reporting is time-consuming, subjective, and prone to fatigue-related errors.

Existing AI tools often provide predictions, but not human-readable reports.

How can we generate coherent, medically meaningful radiology reports from chest X-ray images automatically?

Why This Matters

Improves efficiency in clinical workflows by reducing report turnaround time.

Assists radiologists, especially in under-resourced or high-volume settings.

Standardizes reporting, minimizing inter-observer variability.

Lays the foundation for explainable AI in healthcare—moving beyond classification to natural language descriptions.

Medical report generation is a key step toward trustworthy AI diagnostics.

Vision-Language Modeling for Radiology Reporting

We design a two-part neural model:

Image Encoder : extracts visual features from X-rays.

Text Decoder (ClinicalBERT): generates natural-language reports based on visual input.

Fine-tuned on paired chest X-ray + report datasets to learn medical language patterns.

Deployed via a simple Streamlit web interface, supporting real-time inference from user-uploaded images.

Output: Fluent, medically relevant reports generated in seconds.

Demo and the link to our project Git repo

Git : https://github.com/AARONYOUNG2023/2025Spring_DS_Capstone_Group2