

# Leveraging Large Language Models (LLM) Agents for Explainable Healthcare Decision Support

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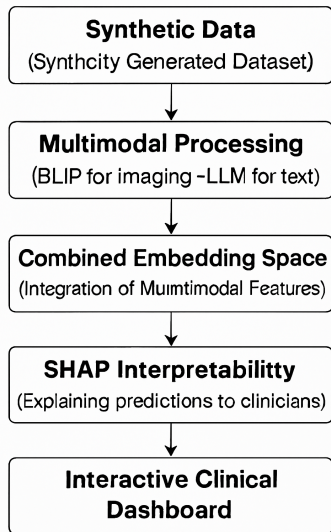
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# Problem Statement

- Healthcare decision-making depends on complex multimodal data (text + imaging).
- Traditional AI lacks transparency, limiting clinical trust.
- **Goal:** Build an interpretable clinical decision-support system.

# System Architecture

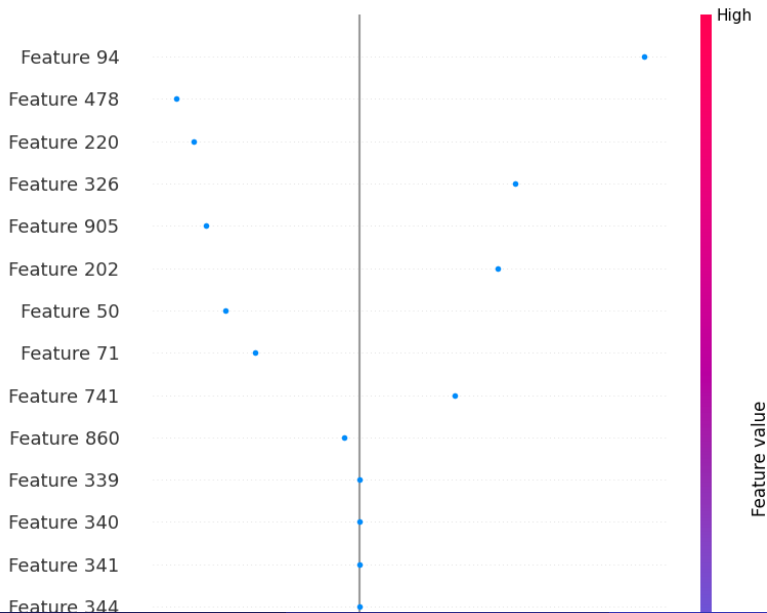


- **Data:** Synthetic clinical notes (Faker) + public medical images.
- **Model:** CLIP for joint multimodal embeddings.
- **Explainability:** SHAP KernelExplainer for feature interpretation.

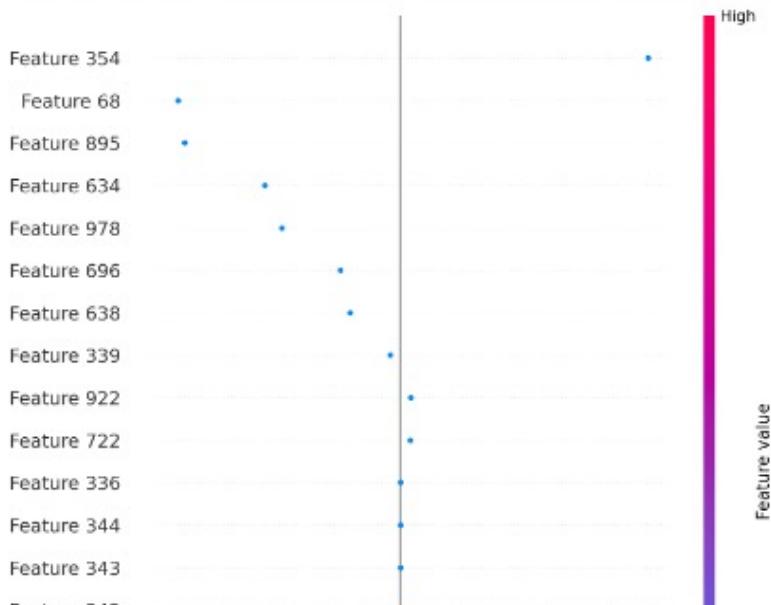
# Code Workflow Summary

- 1 Generate synthetic notes/images.
- 2 CLIP embedding extraction.
- 3 Risk score calculation (mean over embeddings).
- 4 SHAP explainability visualization.

# Results: Pneumonia Patient



# Results: Normal Patient



# Comparative Analysis

- Normal patient: Minimal feature contribution.
- Pneumonia patient: Significant feature impact.
- Model successfully distinguishes healthy vs diseased patterns.



# Conclusion

- Multimodal LLM integration (CLIP) effectively processes clinical data.
- SHAP interpretability improves AI transparency.
- Framework enhances clinician trust and decision support.

# Future Work

- Use real clinical datasets (e.g., MIMIC-III, CMS).
- Expand embedding interpretation into clinical terms.
- Clinical setting validation.