



MEPCO SCHLENK ENGINEERING COLLEGE

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

GLIFFY DORNICK E R | KARNASSAGAR S | SAKTHI JEGANATHAN R IV AI&DS



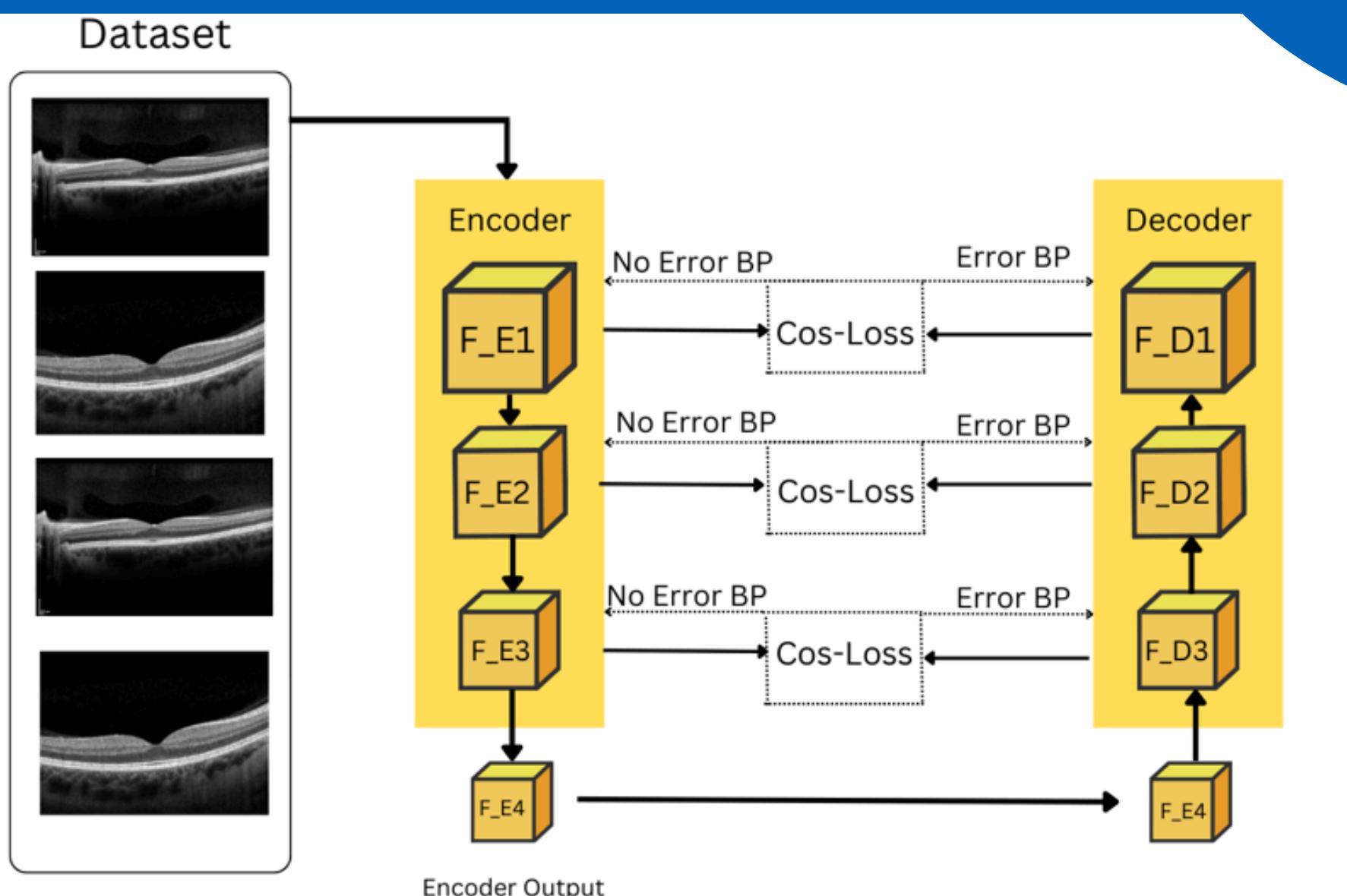
ABSTRACT

Modality Classification: Medical images from different modalities (e.g., MRI, X-ray, OCT) are first classified using a deep learning model to identify their type.

Anomaly Detection: A Heterogeneous Autoencoder is trained on normal images to detect anomalies based on reconstruction errors.

Anomaly Classification: Detected abnormal images are then passed to an ensemble of models (VGG-16, DenseNet-121, EfficientNet-B0) to classify specific diseases.

HETEROGENOUS AUTO-ENCODER



*Multi-modality
Anomaly Detection and
Classification In Medical
Image with Multi-scale
sparse transformer*

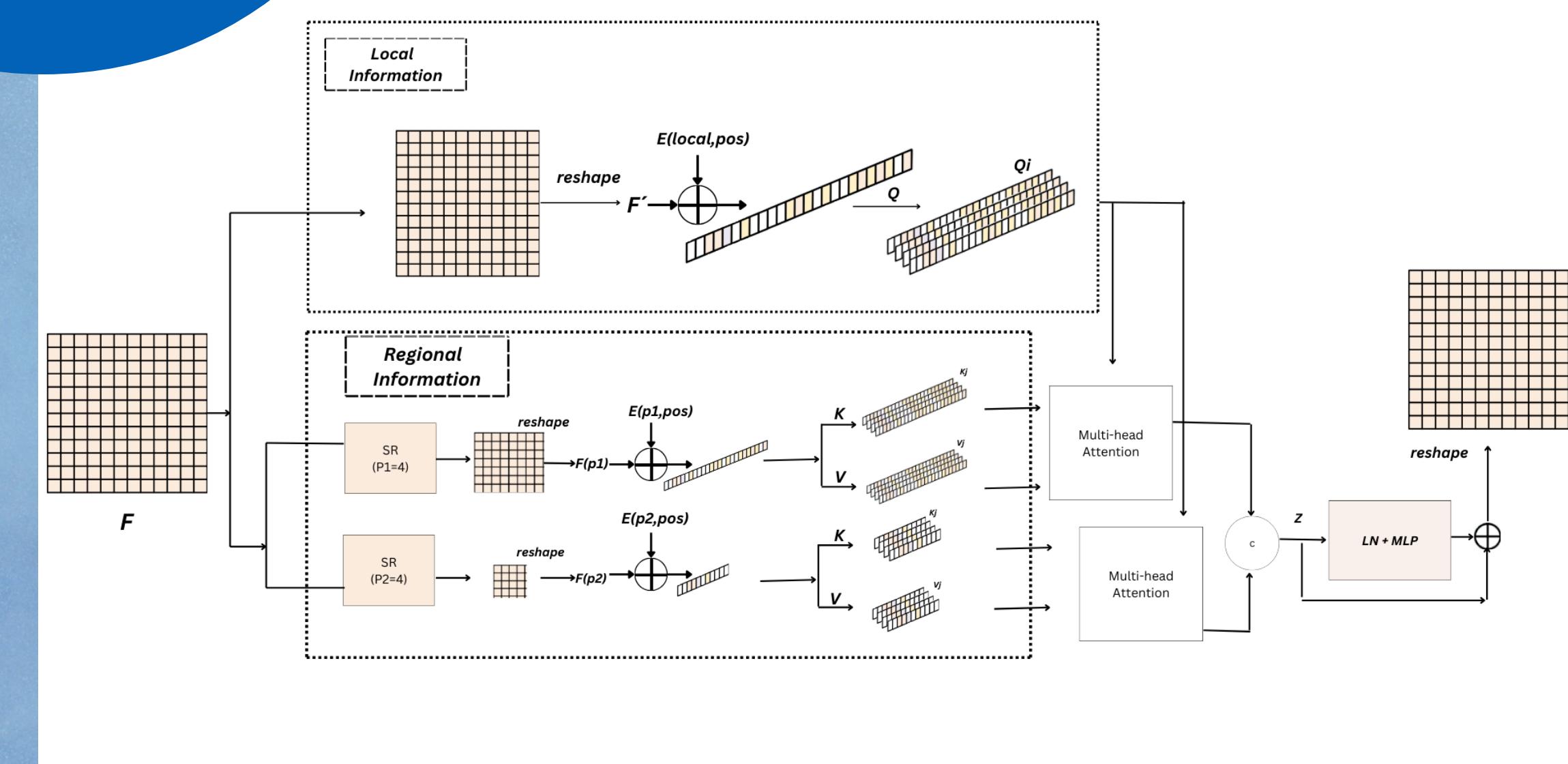
OBJECTIVE

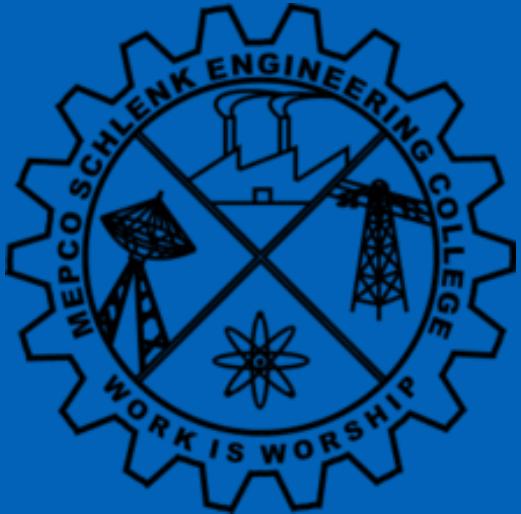
To accurately classify medical images by their modality (e.g., Brain MRI, Chest X-ray, Retinal OCT) to ensure appropriate processing paths.

To detect anomalies in medical images using a Heterogeneous Autoencoder trained exclusively on normal data, enabling robust identification of abnormal cases.

To classify the type of anomaly present in abnormal images using an ensemble of deep learning models, improving diagnostic specificity and reliability.

MULTI-SCALE SPARSE TRANSFORMER





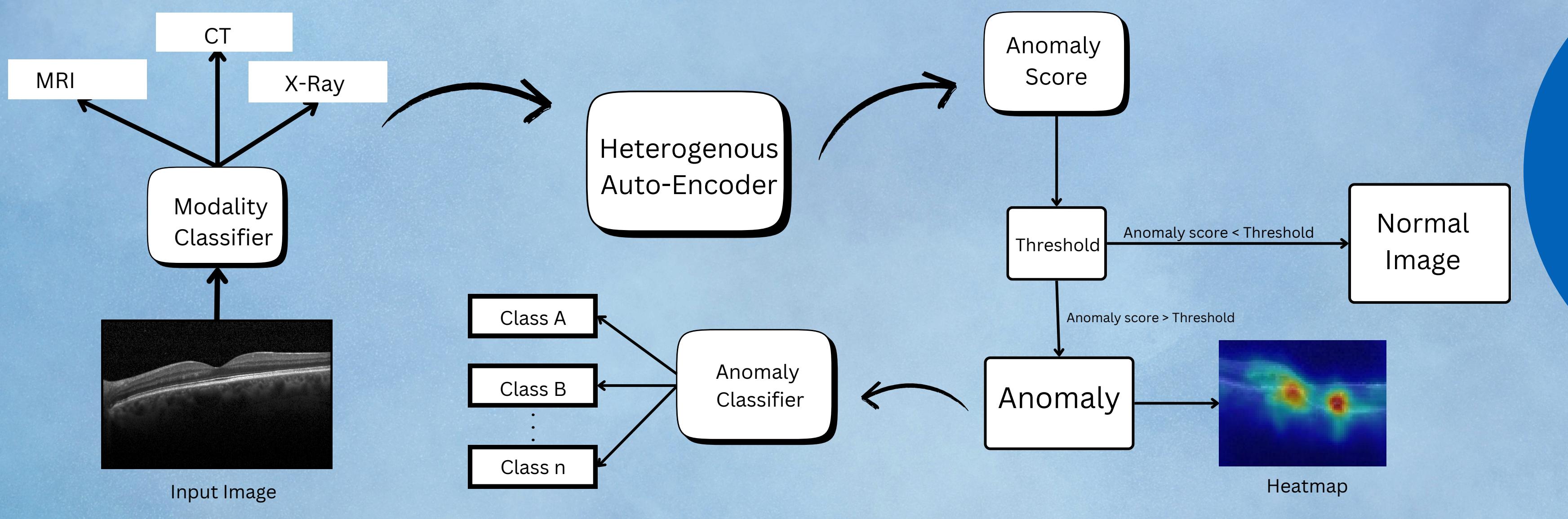
MEPCO SCHLENK ENGINEERING COLLEGE



DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

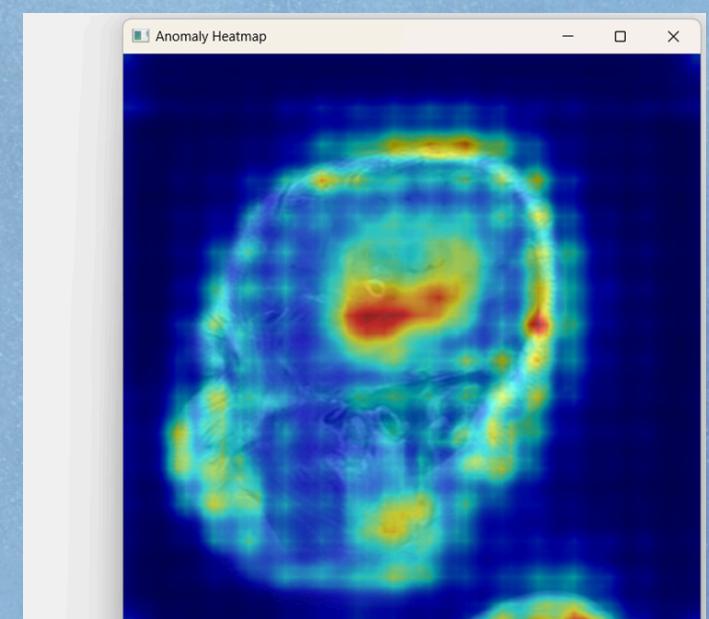
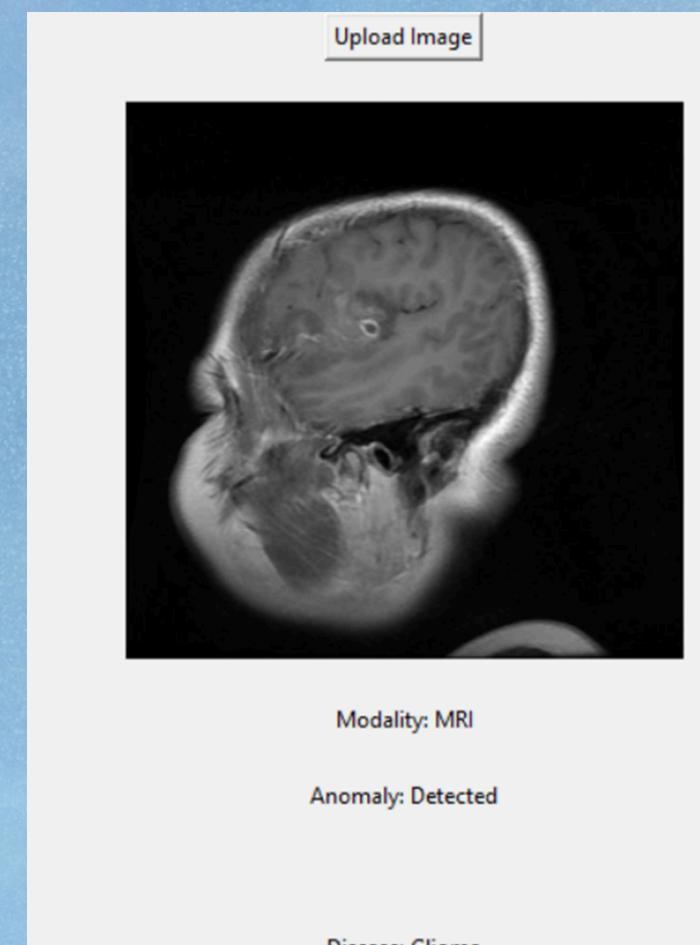
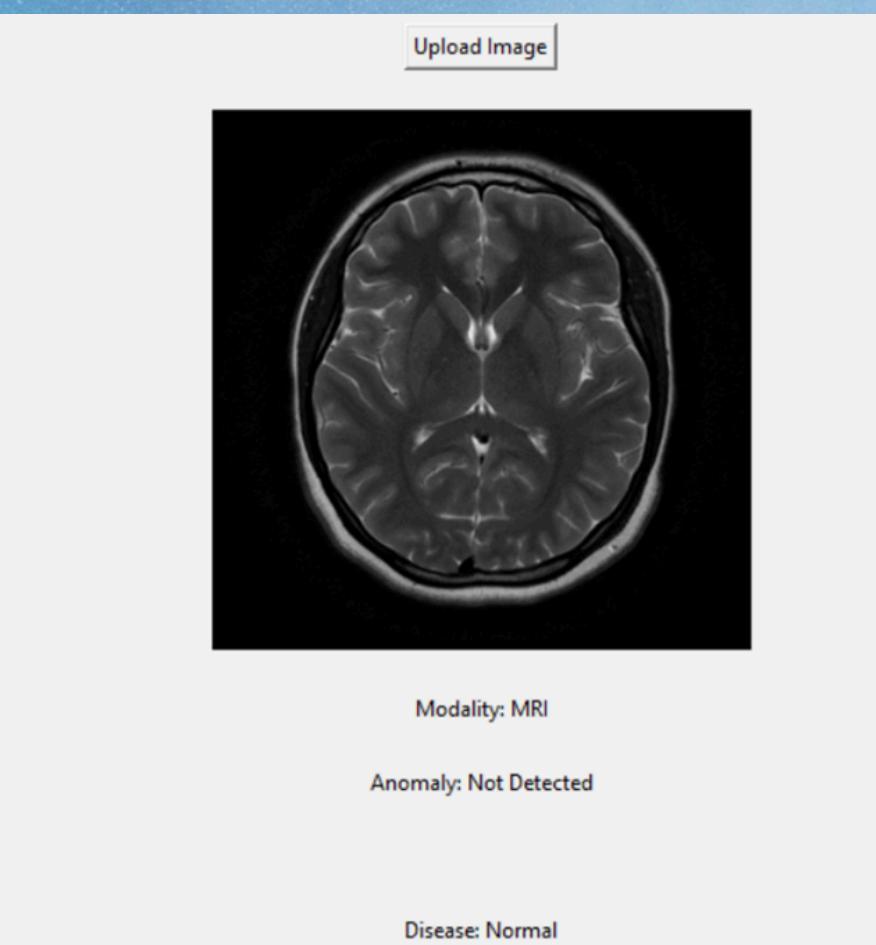
GLIFFY DORNICK E R | KARNASSAGAR S | SAKTHI JEGANATHAN R IV AI&DS

PROPOSED WORK-FLOW



*Multi-modality
Anomaly Detection and
Classification In Medical
Image with Multi-scale
sparse transformer*

RESULT



Example 1

Example 2

REFERENCES

Lu, Shuai, Zhang, Weihang, Zhao, He, Liu, Hanruo, Wang, Ningli, and Li, Huiqi, "Anomaly Detection for Medical Images Using Heterogeneous Auto-Encoder," *IEEE Transactions on Image Processing*, 2024, Volume 33, Issue 4, Pages 2770-2782, DOI: 10.1109/TIP.2024.3381435.

Hussain, Adnan, Amin, Sareer Ul, Lee, Hunjoo, Khan, Asma, Khan, Noreen Fayyaz, and Seo, Sanghyun, "An Automated Chest X-Ray Image Analysis for Covid-19 and Pneumonia Diagnosis Using Deep Ensemble Strategy," *IEEE Access*, 2023, Volume 11, Pages 97207-97220, DOI: 10.1109/ACCESS.2023.3312533.