Breast Cancer Detection System
# Predicting breast cancer using AI

BreaDICT

ABSTRACT

BreaDICT is a breast cancer detection system that combines traditional machine learning and deep learning (YOLOv8) to analyze mammogram images. By leveraging publicly available datasets (CBIS-DDSM, MIAS), it aims to support early diagnosis and reduce radiologist workload. The system processes raw images through advanced preprocessing steps, detects suspicious areas, and classifies them into benign, malignant, or normal. It features a user-friendly interface for real-time use in medical environments.

METHODOLOGY

Datasets

MIAS

- ~300 images
- Annotated manually
- Includes normal cases
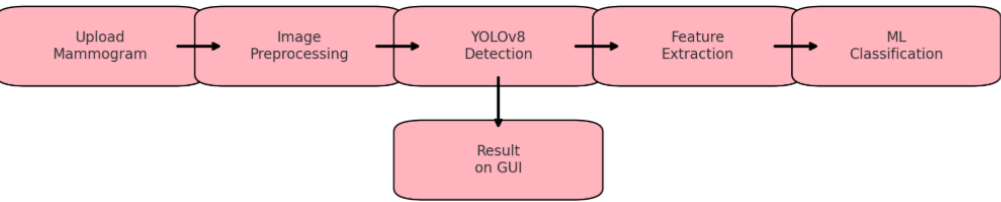
Preprocessing Techniques

Images were enhanced using several preprocessing techniques to improve detection and classification performance:

- CLAHE (Contrast Limited Adaptive Histogram Equalization)
- Gaussian Blurring
- Median Filtering
- Image Inversion
- Histogram Equalization

Model Evaluation & Results
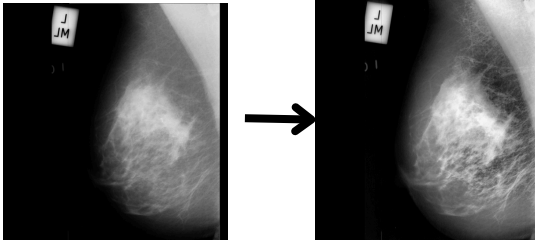
FUTURE WORK

📊 Expanding the dataset with more diverse and well-annotated images, especially malignant cases.
📦 Integrating Nobel dataset (if accessible) to improve clinical relevance and model generalization.
🔍 Multi-class classification for identifying specific types of abnormalities (e.g., masses vs. calcifications).
🏥 Integration with hospital systems (PACS) for real-time diagnostic assistance and report generation.

CONCLUSION

BreaDICT provides a robust, accessible, and intelligent system for breast cancer detection. It combines medical imaging, AI, and human-centered design to support early diagnosis and reduce error. With further development, BreaDICT can become a valuable tool in medical practice.

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