Breast Cancer Classification using ResNet18 – Professional Project Report

Project Overview

This project implements a deep learning model for Breast Cancer image classification using ultrasound images.

A transfer-learning approach with ResNet18 is used to classify images into: Normal, Benign, and Malignant.

Objective

Develop a Computer Vision model capable of detecting breast cancer type using ultrasound images with visualization, confusion matrix and Gradio deployment.

Dataset Structure

Dataset stored in Google Drive structured as:

Dataset_BUSI_with_GT/

├─ benign/

├─ malignant/

└─ normal/

Model Architecture

- Base Model: ResNet18 (pretrained)

- Fully Connected Layer customized

- Dropout used to reduce overfitting

- Output classes = 3

Training Details

- Split: 70% Train / 15% Val / 15% Test

- Loss: CrossEntropy

- Optimizer: Adam

- Scheduler used

- Augmentations applied

Model Results (Add After Training)

Insert images here for:

• Accuracy curve

• Loss curve

• Confusion Matrix

• Sample predictions

Example:

Final Accuracy ~ 90%+

How to Run

1. Upload dataset

2. Run training pipeline

3. Evaluate test data

4. Launch Gradio UI

Deployment

Includes a Gradio interface for real-time predictions.

Future Improvements

- Use ResNet50 or EfficientNet

- Add GradCAM

- Add more augments

Developed By

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