BodyScan – AI-Powered Medical Image Classifier

Desktop App with Deep Learning, Flask APIs, and JavaFX UI

Introduction

BodyScan is an AI-powered desktop application designed to classify medical images using deep learning. It integrates multiple disease detection models with Flask APIs and a JavaFX user interface.

System Architecture

The system connects deep learning models with a Flask backend, and a JavaFX GUI frontend. Users upload an image, which is sent to the Flask API, processed by the trained model, and the result is displayed in the UI.

Dataset & Preprocessing

Datasets include chest X-rays, retinal images, bone fracture scans, and brain MRIs. Data augmentation techniques like rotation, flipping, zoom, and brightness adjustments were applied.

Deep Learning Models

The application uses CNN architectures trained on medical datasets. Reported accuracies: - Chest X-ray: 93% - Diabetic Retinopathy: 90% - Brain Tumor: 89% - Bone Fracture: 98%

Backend (Flask APIs)

Flask serves as the backend framework. API endpoints include /predict_chest, /predict_brain, etc. Each endpoint accepts an image and returns a JSON prediction result.

Frontend (JavaFX App)

JavaFX provides a clean, styled interface. Features include image upload, styled result windows, and smooth animations.

Installation & Usage

Requirements: Python, Flask, TensorFlow, JavaFX. Steps: 1. Train or load models. 2. Run Flask APIs (e.g., python api_chest.py). 3. Launch the JavaFX application. 4. Upload images and view results.

Future Work

Plans include expanding to more diseases, deploying as a cloud or mobile solution, and improving UI with dashboards.