Diabetic Foot Ulcer Predictor using Deep Learning

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1. Abstract

Diabetic foot ulcers (DFUs) are among the most severe complications faced by diabetic patients, often resulting in infections, amputations, and even life-threatening conditions if not detected early. This project utilizes advanced Deep Learning models to accurately predict and classify foot ulcers from medical images. By combining Artificial Intelligence with healthcare, the system ensures faster diagnosis, higher precision, and improved patient outcomes, representing a revolutionary step in preventive healthcare.

2. Models Used

We implemented multiple Deep Learning models to enhance prediction performance: - **Convolutional Neural Networks (CNNs)** for automatic feature extraction from ulcer images. - **Transfer Learning Models** such as MobileNetV2 and ResNet50 for efficient and accurate classification. - **Fine-Tuned Layers** adapted to medical image datasets, ensuring robustness and reliability.

3. Technologies

Our solution leverages modern technologies for implementation and deployment: - **TensorFlow & Keras** for model training and evaluation. - **OpenCV** for image preprocessing and enhancement. - **Python** for development, integration, and automation. - **GPU Acceleration** for efficient computation during training and testing.

4. Role in Medical Field

The proposed system plays a crucial role in modern medical diagnosis: - Enables **early detection** of diabetic foot ulcers, reducing the risk of complications. - Assists doctors through **AI-driven decision support**. - Provides **cost-effective healthcare** by reducing amputation and hospitalization rates. - Improves **patient quality of life** through timely and precise diagnosis.