Gesture-Based Tool for Sterile Browsing Using Radiology Images

Abstract :

In modern medical environments, maintaining sterility while interacting with radiological imaging systems is critical. To address this, the proposed project initially aimed to develop a **Gesture-Based Tool for Sterile Browsing Using Radiology Images**, allowing medical practitioners to interact with patient scans without physical contact.The system was designed to use hand gestures for image navigation, zooming, and selection. While initial implementation achieved basic gesture capture and frame analysis, real-time, advanced radiology image processing presented hardware and software limitations.

To continue the project effectively, we extended the solution by integrating a **Hand Gesture Recognition System** powered by **Google's MediaPipe** framework.

This system detects hand landmarks from a webcam feed, preprocesses gesture data, and classifies both static and dynamic gestures using **Multi-Layer Perceptron (MLP) classifiers**.

The recognized gestures are then used for navigating basic image operations, demonstrating the concept of sterile, contactless interaction.

This hybrid approach preserves the core aim of touchless operation while adapting to practical development constraints, ensuring a functional prototype that addresses real-world needs in clinical settings.