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Virtual Calculator

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Abstract: *This project presents a Virtual Calculator employing Hand Simulation, a cutting-edge system that leverages computer vision and hand gesture recognition to execute arithmetic operations without physical contact. The system uses real-time image processing and machine learning models to recognize and understand hand gestures, so there is no need for a physical keyboard or touchscreen.*

The main technologies used in this project are OpenCV for processing images, MediaPipe for tracking hands, and deep learning for classifying gestures. A webcam records the user's hand movements, and the system processes the images to find hand landmarks. It then maps certain gestures to math functions like addition, subtraction, multiplication, and division. A custom gesture dataset is also used to make the system more accurate and stable in different lighting and hand conditions.

The main goal of this project is to make a calculation tool that is easy to use and understand, which will improve user interaction while lowering the need for physical contact. This is especially helpful in places where cleanliness is important, like hospitals, labs, and public places. Additionally, it offers an assistive technology solution for people with physical disabilities, allowing them to do math without the limitations of standard input methods.

Keywords: *Virtual Calculator*

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