Virtual Game Controller

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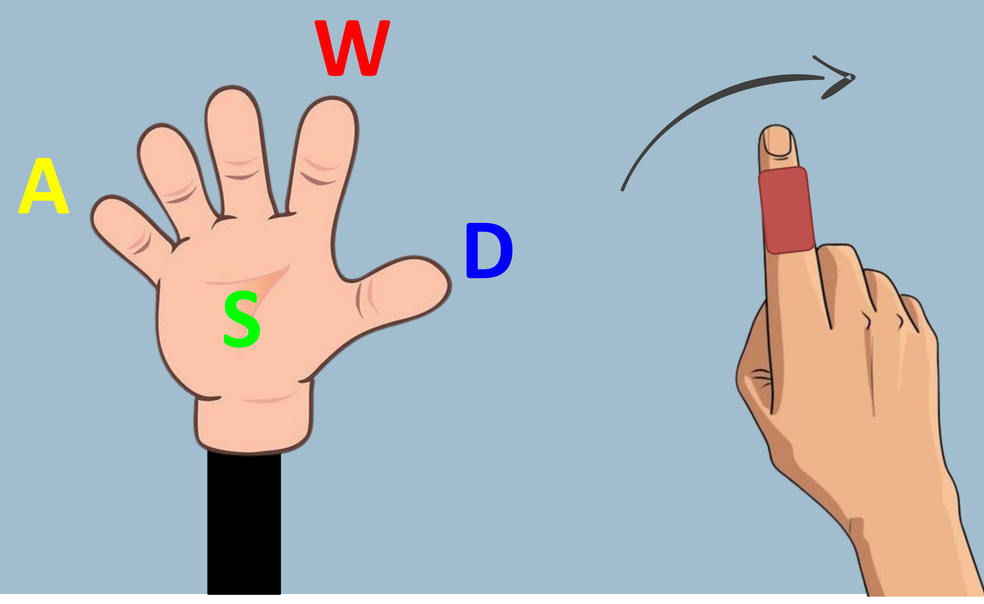

INTRODUCTION

This Python program uses OpenCV and HandTrackingModule libraries to enable users to control the computer mouse and keyboard through hand gestures. It identifies and tracks hand gestures using the webcam and maps them to corresponding keyboard and mouse actions. It allows users to move the mouse cursor, click and type using only hand gestures, making it an accessible means of controlling the computer, especially for individuals with limited mobility.

TECHNOLOGIES

Front End: The program does not have a graphical user interface.
Back End: The program is written in Python and uses several libraries and modules for image processing, hand detection, and simulating mouse and keyboard actions.

LIBRARIES

- **cv2:** OpenCV library for image processing and computer vision
- **datetime:** Python standard library for handling dates and times
- **numpy:** NumPy library for numerical computing
- **HandTrackingModule:** a custom Python module for hand detection and tracking
- **pyautogui:** PyAutoGUI library for simulating mouse and keyboard actions
- **pydirectinput:** PyDirectInput library for simulating keyboard and mouse actions at a lower level
- **win32api:** Windows API library for low-level system functions
- **win32con:** Windows constants for use with win32api

USES

The program detects hand gestures and movements, and maps them to keyboard and mouse actions. It can move the mouse cursor, click, type, and press special keys like spacebar and enter, mainly [W], [A], [S], [D].

CONCLUSION

In conclusion, the Python program utilizing OpenCV and HandTrackingModule libraries enables users to control their computer mouse and keyboard through hand gestures. The program tracks hand movements and maps them to corresponding keyboard and mouse actions, allowing users to move the mouse cursor, click, and type using only hand gestures. This technology provides an accessible and convenient way for individuals with limited mobility to interact with their computer systems, making the program a valuable tool for enhancing computer accessibility. Overall, the program's use of advanced computer vision techniques and integration with standard computer controls provides a powerful and innovative solution for hands-free computer control.

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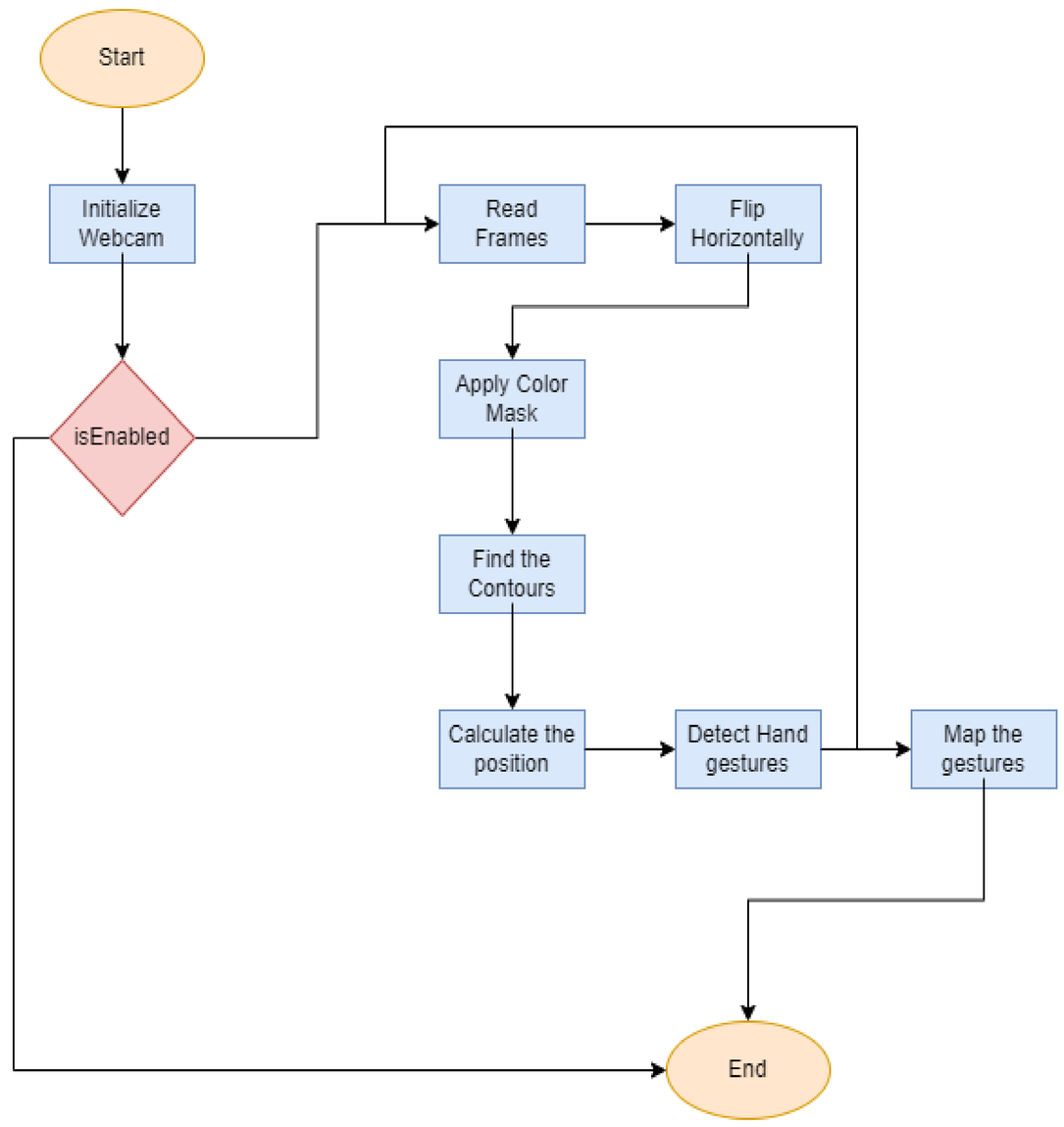
SYSTEM FLOW DIAGRAM



SNAPSHOTS