# GESTURE CONTROLED VIRTUAL MOUSE

The mouse is one of the wonderful inventions of Human-Computer Interaction(HCI)technology. Currently ,wireless mouse or a Bluetooth mouses till uses devices and is not free of devices completely since it uses a battery for power and a dongle to connect it to the PC. In the proposed AI virtual mouse system, this limitation can be over come by employing webcam or a built - in camera for capturing of hand gestures and hand tip detection using computer vision. The algorithm used in the system makes use of the machine learning algorithm .Based on the hand gestures, the computer can be controlled virtually and can perform left click, right click, scrolling functions dragging, volume control, brightness and computer cursor function without the use of the physical mouse. The algorithm is based on deep learning for detecting the hands.

- The Camera Used in the AI Virtual Mouse System. The proposed AI virtual mouse system is based on the frames that have been captured by the webcam in a laptop or PC. By using the Python computer vision library OpenCV, the video capture object is created and the web camera will start capturing video. The web camera captures and passes the frames to the AI virtual system. Capturing the Video and Processing. The AI virtual mouse system uses the webcam where each frame is captured till the termination of the program. The video frames are processed from BGR to RGB color space to find the hands in the video frame.

- single-shot detector model is used by the MediaPipe.

- **Palm detection** - MediaPipe works on the complete input image and provides a cropped image of the hand.

- **Hand landmarks identification** - MediaPipe finds the 21 hand landmarks on the cropped image of the hand.

- Detecting Which Finger Is Up and Performing the Particular Mouse Function. Mouse Functions Depending on the Hand Gestures and Hand Tip Detection Using Computer Vision.