1. <https://journals.sagepub.com/doi/full/10.1177/1550147719875649>

[Sept 14, 2019.](https://journals.sagepub.com/doi/full/10.1177/1550147719875649)

[Use of the Microsoft kinect to help in exercise for Rheumatoid arthritis. This is to fulfill the demand for many nurses and trainers for the daily routine exercise.](https://journals.sagepub.com/doi/full/10.1177/1550147719875649)

1. <https://ieeexplore.ieee.org/abstract/document/8856547>

[October 7, 2019.](https://journals.sagepub.com/doi/full/10.1177/1550147719875649)

To help solve this problem and provide assistance in form of a visual feedback while performing a workout, we propose a system to analyze user's body posture during a workout and compare it to a professional's reference workout. We represent human body as a collection of limbs and analyze angle between limb pairs to detect errors and provide corrective action to the user. Our system builds on the latest advancements using deep learning for human body pose estimation. We use techniques for time series data alignment like DTW [2] (Dynamic Time Warping) along with optical flow tracking to synchronize user/reference videos. We are able to detect and locate errors in user's activity (pose) very effectively based on some threshold deviation between the limb angles.

1. <https://link.springer.com/chapter/10.1007/978-981-16-5157-1_24>

[October 26, 2021](https://link.springer.com/chapter/10.1007/978-981-16-5157-1_24)

After synchronizing user and reference image or video the system gives a green skeleton if the user posture is correct and a red skeleton if the user posture is incorrect. This model has been achieved using the PoseNet library on Tensorflow. The maximum score that the PoseNet model achieves ranges from 0.92874 to 0.98325 for all the key points.

1. <https://ijeast.com/papers/167-173,Tesma501,IJEAST.pdf>

May 2020 in IJEAST

An application that suggests the workouts and tracks it. Auto\_fit uses Postnet for doing pose estimation to find 17 body keypoints followed by using the DNN classifier to identify the state of exercise and then counts the repetitions performed. We collected the videos of trained professionals performing the exercise and then used it to train Auto\_fit. Auto\_fit takes live video feed and counts the repetitions of exercise performed

1. <https://ieeexplore.ieee.org/abstract/document/9708354>

15-17 December, 2021

In this paper, we have proposed an interactive learning-aid tool based on a vision-based hand gesture recognition system. The system uses MediaPipe for hand gesture recognition. The recognized hand gestures use a virtual-mouse-based object controlling system to control various virtual objects created using Unity. The system has been tested using six hand gestures and it is found that the system can be used effectively for controlling various virtual objects.

1. <https://link.springer.com/chapter/10.1007/978-3-030-93247-3_39>

[1 January, 2022.](https://ieeexplore.ieee.org/abstract/document/9708354)

This research provides a method for detecting hand gestures using computer vision techniques for controlling various applications in real-time. The proposed method detects all the skin-colored objects from the captured frames and then detects the face by using Haar based classifier. The number of fingers is detected by the convexity defect approach and then the movement of the hand is tracked. These are considered as the features of the hand gesture recognition system. This hand gesture recognition system doesn’t require any dataset, hence this is simpler to develop. The detected face is blocked. After the gesture is recognized, they’re translated into actions. 20 commands are generated from the hand gestures and sent to the computer via the keyboard. Due to this method, multiple applications like-video player, music player, PDF reader, slideshow presentation, etc. whichever application takes input from the keyboard can be controlled with this single system.

1. [http://www.ijcce.org/papers/175-T30017.pdf](https://link.springer.com/chapter/10.1007/978-3-030-93247-3_39)

[2 March, 2013](https://ieeexplore.ieee.org/abstract/document/9708354)

The main aim of Human Computer Interaction (HCI) is to research and develop new and simpler ways to interact with computers and many other devices as well. Hand Gesture Recognition is one such area of active research for computer scientists. In this paper, we discuss a new method for controlling the mouse movement with a camera. Our method is unique as it does not involve Fuzzy models, Hidden Markov Models, etc. for recognition. Instead we use simpler segmentation and recognition techniques for recognition of simple hand gestures.

1. [https://www.irjmets.com/uploadedfiles/paper/volume\_3/issue\_12\_december\_2021/17928/final/fin\_irjmets1641224809.pdf](https://link.springer.com/chapter/10.1007/978-3-030-93247-3_39)

[December 2021](https://link.springer.com/chapter/10.1007/978-3-030-93247-3_39)

The computer's camera will scan the image of various movements made by a person's hand, and the mouse or pointer will move in response to the movement of the gestures, including doing right and left clicks using distinct gestures. Similarly, different gestures can be used to control the keyboard, such as a one-finger gesture to choose an alphabet and a fourfigure gesture to swipe left and right. With no wires or other devices, it will function as a virtual mouse and keyboard.

1. [https://link.springer.com/chapter/10.1007/978-981-16-4807-6\_12](https://link.springer.com/chapter/10.1007/978-3-030-93247-3_39)

1 January 2022

This interface consists of the detection, tracking, and recognition module. This paper explores the use of Computer Vision to create a gesture-based game, controlled by hand using the Haar Cascade classifier to classify and detect the object. With the help of simple hand gestures, the model has been trained to enable users to play the game of “Flying Wing Mario”. In this proof-of-concept game, the users are able to play the game through gesture recognition as it provides them with an enhanced interactive experience integrating the virtual and the real-world object.

1. [https://ieeexplore.ieee.org/abstract/document/9673251](https://link.springer.com/chapter/10.1007/978-3-030-93247-3_39)

10-12 Nov. 2021

Hand gestures are the most natural and effortless manner of communicating. The camera’s output will be displayed on the monitor. The concept is to use a simple camera instead of a classic or standard mouse to control mouse cursor functions. The Virtual Mouse provides an infrastructure between the user and the system using only a camera. It allows users to interface with machines without the use of mechanical or physical devices, and even control mouse functionalities.