INTRODUCTION

The original two-player game, Rock Paper Scissors, particularly comes under other fast-finger-throwing games, also referred to as fast-hand-flashing games. The fist’s up-down motion by the opponents to commence the game, saying "Shoot!", out of the three hand gestures of the game: rock (show of closed fist), paper (show of open hand), and scissors (show of index and middle fingers in the shape of scissors), where those three gestures beat each other in a fixed manner, or a draw takes place if the players show the same gesture, leading to the starting-off the game again. All three hand motions are superior to each other in an order which goes like the Rock beats the Scissors gesture, the Scissors beats the paper's gesture and the Paper beats the rock gesture. As a general rule, the reason for such rules is, sharp scissors can't cut through rock while it can beat the paper, wherein the rock can break the scissors but gets beaten by the paper as it gets covered by the rock. Coins tossing or picking straws, on the other hand, need particular things to be used to compete, keeping rock, paper, scissors distinct from each other. There is a biological application of the game rock, paper, scissors used in the investigation of competing strategies. This game is always regarded to be a balanced and randomised play, based on the notion since individuals are capable of acting unpredictably. Despite their best efforts, people are much more foreseeable than we'd want to believe.

Primary aim of this research has been to develop a computer vision-based programme that could perform Rock, Paper, Scissors. Additional objectives included investigating principles of deep learning as well as human-computer interaction concerning machine learning. There are two main types of action gesture detection used nowadays. One uses a glove for identification, while the other relies on visuals. It is common for current gesture identification systems to compute the RGB representation of a motion beforehand and utilizing model comparison to recognise the motion. Gesture recognition and competitor predictions are perhaps the most important aspects of this research.

Once the hand gesture is detected, the software starts recognizing it. Throughout this investigation, a webcam is used to gather and analyze the participant's hand gestures. Many things may be accomplished with simple hand gestures.  In order to detect and recognize hand gestures, MediaPipe and CNN were combined in this research. By employing an approach such as this, it has become practicable to showcase and identify gestures in real-time using conventional webcams or standard HD cams accessible to the public rather than having a background with many cameras at a time focusing on a hand. Mediapipe, developed by Google, improves in better identification as well as clarity. Once the gesture has been determined, it moves on to the next step. Analyzing previous moves is essential to predicting the player's future move. If you want to win more often, you should employ some type of opposition prediction. Gestural data is extracted via pictures, and trends in competitors' behaviour are predicted using machine learning and deep learning techniques.