INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, NAGPUR

Computer Vision

Lab Report

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Abstract:

Computer vision is a field of science that computes and systems to derive meaningful information from digital images, videos and other visual inputs and take action or make respond on the basis of the information.

For the purpose of this project, we used computer vision for a rather light and fun use. We created several games using OpenCV (a computer vision library).

We created three small games using pre-existing python libraries and integrated all three together. The games are rock-paper-scissor and an obstacle avoiding games one using your hand and the other using your body for avoiding the obstacle. For the rock-paper-scissor, game when the user makes the specific hand sign for any of the symbol computer will also show any random choice and decide the winner. For the obstacle avoiding games, the user uses their hand for the purpose of moving the character and avoiding the obstacles.

Inspiration and Motivation:

As we all know that there is a pandemic going on all over the world and we all are at home with nothing much to entertain ourselves, so we decided to created simple games. It is a simple way to entertain our self and provide some physical exercise. We first decided to do something which involves some physical exercise along with fun and then decide to add some other small games.

In the starting of the project we have a few different games and then settled to go with these three games for them being fun and simple for the users to play.

Existing Similar Technologies:

There are many small user made libraries in python for simple games like ‘freegames’ etc., which have games like snake game, crossword, hangman etc.

These libraries have simple games that can be implemented into our codes by simply calling the libraries into our code and nothing more is to be done.

For the purpose of tracing the user for interacting with the game we have used prebuild libraries and already trained modules and called them into our code.

Speciality of Our Project:

Our project being different from that already available is that we have used openCV to along with other python to recreate simple already existing games more interactive and physical for the players.

The games are interactive with the users and provides the players some physical exercise along with being simple and fun to play.

Algorithm of Pseudo Code:

The games work such that first the players are supposed to choose the game they want to play and then the game the game is launched and if you quit that game you can launch other games.

The code algorithm is such that:

Launch code (main.py) → select the game you wanted to play → the program for the selected game is launched → the game launched is played against the computer → the score is displayed and repeated again

The algorithm for rock-paper-scissor:

The code shows null as their option for the start → user make the hand sign for their choice → the computer reads the sign and choses a random choice → the computer and user choices are compared and winner is decided → the winner is displayed and the code returns to start

The algorithm for dinosaur game:

The game starts with the dinosaur running → the code tracks palm of players → the character jumps to dodge the obstacle if the user palm is closed → the code returns back to start if obstacle is avoided → if the obstacle is not avoided the game ends

Observation and Conclusion:

We have successfully implemented and created simple games using computer vision and openCV. With this we have learned about openCV and other computer vision libraries in python which can be used for tracking our palm, or our whole body.