Movement Controlled Snake-Game

Porter Doughty
Goal:

Utilize facial detection software to implement a system of control based on movement.
OpenCV
OpenCV

Open source computer vision, or OpenCV, is a python library that contains modules used for facial recognition, object detection, and various other camera related functions.

- Imshow
- Read
- Draw
Calculating Inputs Based on Movement
Bounding box and center point calculation

Once OpenCV was working on the raspberry pi with the raspberry pi camera module, the next task was to create the bounding box and calculate the center point based on the box drawn around the face.

The formula being used is

\[ \left( \frac{L + R}{2}, \frac{T + B}{2} \right) = (\text{CenterX}, \text{CenterY}) \]

\( L = \text{X coordinate of left edge} \)
\( R = \text{X coordinate of right edge} \)
\( T = \text{Y coordinate of left edge} \)
\( B = \text{Y coordinate of right edge} \)
Inputs based off location of center

Now that we have the point, we have to divide the window into a grid system.

Depending on where the center point is, a different input will be written to the text file inputData.txt.

Left = “L” written to file
Right = “R” written to file
Down = “D” written to file
Up = “U” written to file
Controlling the snake!

With a real time, constantly updating text file. We have to adjust the code in the game script to take the characters written to the text file as an input.

Ex: inputData.txt = “L” / (inside of game script) if getline of inputData is “L”, go left
Presentation
Future implementations and projects

There are an abundance of applications utilizing OpenCV. Some future projects I would love to partake in include but are not limited to...

- Full Body tracking
- Automatic Facial recognition of unknown users and creating new profiles.
- Different games, (I was thinking specifically of something like red light, green light...)
- Possible implementation with robotics and drones.
- Facial recognition based cloud server, no passwords, only verified users.
References and Acknowledgements


~And a special thank you to Dr. Ayman El Mesalami for allowing me to partake in this opportunity.