CS3483 Multimodal Interface Design

Assignment

Overview

In the assignment, you are required to use p5.js and the ml5.js HandPose model to develop an interface for viewing and interacting with an image. These actions are performed by using fingertip detection and keyboard operations.

Detailed Requirement

1. Initial Setup

Create a display window.

Load and display an image in the window.

The instant view of the camera should be displayed next to the image and has the same size as the image.

2. Index fingertip detection

A small circle should be drawn on the camera view to indicate the position of the detected index fingertip. When you move your index finger in front of the camera, the circle should keep following your fingertip. A corresponding position indicator should also be drawn on the image to follow the movement of your index fingertip.

3. Viewing the image

When the '**v**' key is pressed and released, the interface should enter the **view image** mode. In this mode, a blurred version of the image should be displayed. When your index fingertip is moving in the camera view, a rectangular area around the position indicator in the blurred image should display the corresponding region from the original image without blurring. When the position indicator moves away, the blurred appearance of the image region should be restored.

4. Freehand drawing on the image

When the '**f**' key is pressed and released, the interface should enter the **freehand drawing**

mode. In this mode, a freehand trace should be drawn on the image according to the movement of your index fingertip.

5. Drawing circles on the image

When the '**c**' key is pressed and released, the interface should enter the **circle drawing** mode. In this mode, the original image should be displayed. When your index fingertip is moving in the camera view, a circle should be drawn at the position indicator on the image. The circle should be filled with the pixel color at the location of the position indicator with a suitable degree of opacity. When the position indicator moves away, the circle should be retained. The radius of the circle should be adjusted in proportion to the distance between the tips of your thumb and index finger.

6. Exiting the view image/freehand drawing/circle drawing mode

When the '**e**' key is pressed and released, the interface should exit from the **view image/freehand drawing/circle drawing** mode, and the original image should be re-displayed.

Assignment Submission

- **Program (40%)**

You should submit your p5.js program and the associated image file.

- **Report (60%)**

You should summarize your work in the form of a report which should include:

1. A description of the design of the different sections of your program.
2. Screen captures of the output.
3. Limitations and possible improvements of the program.