Face Filters

AI Model Development

Time: 60 mins

Introduction

In this class, the student/s will learn to add face filters on the screen , select then using fingers and drag them around the screen..

New Commands Introduced

- os.listdir()   This method in python is used to get the list of all files and directories in the specified directory.

- pathList.sort()   The `sort()` method is used to sort the elements of an array and return the sorted array in ascending order based on the Unicode values

- math.floor()   This static method always rounds down and returns the largest integer less than or equal to a given number.

- cvzone.overlayPNG()   Helps overlay the pictures and textures on the picture.

Vocabulary

- Overlay: Covering the surface of something with coating.
- Filter: Separate things bases on rules/guidelines

Learning Objectives

Student/s should be able to:
- ***Recall*** how to scroll, take screen shot of the screen using fingers.
- ***Demonstrate*** how to select the image on the screen using fingers of both the hands.
- ***Explain*** the concepts of creating the filters menu and interaction with the camera feed to drag and drop the filter images.
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Activities

1. **Class Narrative:** *(2 mins)*
   - Brief the student/s about creating a filters menu and interaction with the camera feed using hand and finger detection.

2. **Concept Introduction Activity:** *(5 mins)*
   - Let the student/s play the explore-activity to select the filters on the screen and drag them around the screen.
   - Using the slides, explain that the student/s will learn:
     - To create a list of filters.
     - to create a filter menu.
     - to drag and drop filters.

3. **Activity 1:Create a list of filters :** *(6 mins)*

   Student Activity: *(6 mins)*
   - Guide the student/s to upload the filters in a folder and store them in a variable.
   - Guide the student/s to use loop to read and resize each item in a list and to store the resized images in a new list.

4. **Activity 2: Create a filter menu:** *(6 mins)*
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   Student Activity: *(6 mins)*
   - Guide the student/s to determine the position to place image filters on camera and overlay images on the camera feed screen.
     Probing question: What are the coordinates of the top left corner of the screen?
     Expected answer: (0,0) - x-positon 0 and y-position 0

5. **Activity 3: Drag and drop filters:** *(24 mins)*

   Teacher Activity: *(12 mins)*
   - Explain to the student/s how to find the image selected by the index finger by .

   - Demonstrate to the student/s how to start and stop dragging the image selected on the screen.

   Student Activity: *(12 mins)*

   - Guide the student/s to find the image selected by the index finger by using a while loop to check the x-position of the index fingertip of each image .

   - Guide the student/s to start and stop dragging the image selected on the screen by changing the x-position and y-position of the selected image to match the x-position and y-position of the index finger..

6. **Introduce the Post class project:** *(2 min)*
   - Create an interface for Quiz in which you can select your answers using gestures.

7. **Test and Summarize the class learnings:** *(5 mins)*
   - Check for understanding through quizzes and summarize learning after respective missions.
   - Summarize the overall class learning towards the end of the class.

8. **Additional activities:**
   - Encourage the student/s to display the filters in a vertical menu.
   - Encourage the student/s to select a image filter from the vertical menu.

9. **State the Next Class Objective:** *(1 min)*
   ● In the next class, student/s will learn to place the face filters on your face.

U.S. Standards:

CSTA: 2-AP-11, 2-AP-12, 2-AP-13, 2-AP-14, 2-AP-19

Links Table		
Activity	**Activity Name**	**Link**
Class Presentation	Face Filters	https://s3-whjr-curriculum-uploads.whjr.online/1cf00d6c-d750-44ee-8855-0d63c749885d.html
Explore Activity	Face Filters	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS
Student Activity 1	Create a List of Filters	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS-BP
Teacher Reference: Student Activity 1 Solution	Create a List of Filters: Solution	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS
Student Activity 2	Create the Filter Menu	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS-BP
Teacher Reference: Student Activity 2 Solution	Create the Filter Menu: Solution	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS
Teacher Activity 3	Find the Image Selected	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-TAS-BP
Teacher Reference: Teacher Activity 3 Solution	Find the Image Selected: Solution	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-TAS
Student Activity 3	Drag and Drop a Filter	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS-BP
Teacher Reference: Student Activity 3 Solution	Drag and Drop a Filter: Solution	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS
Student's Additional Activity 1	Create a Vertical Menu	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS-BP
Teacher Reference: Student's Additional Activity 1 Solution	Create a Vertical Menu: Solution	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS
Student's Additional Activity 2	Select an Filter from Vertical Menu	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS-BP
Teacher Reference: Student's Additional Activity 2 Solution	Select an Filter from Vertical Menu: Solution	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-SAS
Post Class Project	Quiz Screen with Gestures	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-PCP-BP

Teacher Reference: Post Class Project Solution	Quiz Screen with Gestures: Solution	https://github.com/Tynker-Computer-Vision/TNK-M9-PRO-C71-PCP