ARTIFICIAL INTELLIGENCE (UCS 411)

A Project Synopsis

Submitted to:

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PROJECT TITLE: "Color Recognition System"

PROJECT DESCRIPTION:

Color plays an important role in human daily life for recognition. Color plays a crucial role in how we perceive and analyze things around us. Based on primary colors (Red, Green, Blue), a lot of color models were established to quantitatively measure color.

Step 1: Creating Files and Importing Libraries
Install OpenCV, Numpy and Pandas libraries in your Python environment.

Step 2: Taking an image from the user
Users are free to add any image for color recognition.

Step 3: Read the CSV file with pandas

The pandas library is very useful when we need to perform various operations on data files like CSV. pd.read_csv() reads the CSV file and loads it into the pandas DataFrame. We have assigned each column with a name for easy accessing.

Step 4: Set a mouse callback event on a window
First, we created a window in which the input image will display. Then, we set a callback function which will be called when a mouse event happens.With these lines, we named our window as 'image' and set a callback function which will call the draw_function() whenever a mouse event occurs.

Step 5: Create the draw_function
It will calculate the rgb values of the pixel which we double click. The function parameters have the event name, (x,y) coordinates of the mouse position, etc. In the function, we check if the event is double-clicked, then we calculate and set the r,g,b values along with x,y positions of the mouse.

Step 6: Calculate distance to get color name
We have the r,g and b values. Now, we need another function which will return us the color name from RGB values. To get the color name, we calculate a distance(d) which tells us how close we are to color and choose the one having minimum distance.
Our distance is calculated by this formula:

d = abs(Red – ithRedColor) + (Green – ithGreenColor) + (Blue – ithBlueColor)

Step 7: Display image on the window
Whenever a double click event occurs, it will update the color name and RGB values on the window.

APPLICATIONS:

1. **Traffic Light Color detection**
2. **Skin color detection**
3. **Biometric Recognition**