

Trick2: Project a card

Platform: PyCharm Environment: Python 3.1

I made modifications to the program from the first question. First, the system detects the position of the paper. If it's not clear, the color detection module can assist. Then, the paper's design is changed using predefined gestures.

Problem: I encountered was that the system did perform the desired behavior, but the projection of the playing cards was particularly rough. So, I am trying to find ways to optimize it.

Solution:

```
rect = cv2.minAreaRect(vertices)
box = cv2.boxPoints(rect)
box = np.int0(box)

cv2.drawContours(imgContour_hand_test, contours=[box], contourIdx=0, color=(0, 0, 0), thickness=2)

x, y, w, h = cv2.boundingRect(box)
coin_roi = result[y:y+h, x:x+w]
custom_image_resized = cv2.resize(color_spade, dsize=(w, h))
result[y:y+h, x:x+w] = cv2.addWeighted(coin_roi, alpha=0, custom_image_resized, beta=1, gamma=0)
```

I came up with was to achieve more accurate card detection by utilizing [cv2.minAreaRect()]. However, due to limitations with [cv2.addWeighted], it caused the system to crash. The specific error message received was: error: (-209:Sizes of input arguments do not match) The operation is neither 'array op array' (where arrays have the same size and the same number of channels), nor 'array op scalar', nor 'scalar op array' in function 'cv::arithm_op'

So, in the end, the focus was on ensuring the successful execution of the program. As a result, the following code was retained.

```
x, y, w, h = cv2.boundingRect(vertices)
coin_roi = result[y:y+h, x:x+w]
custom_image_resized = cv2.resize(color_diamonds, dsize=(w, h))
result[y:y+h, x:x+w] = cv2.addWeighted(coin_roi, alpha=0, custom_image_resized, beta=1, gamma=0)
```

Step 1: Align your camera with the paper and your hand.

Step 2: Begin changing gestures.

Step 3: [Spades] appears when [1] is shown,

[Clubs] appears when [2] is shown,

[Diamonds] appears when [3] is shown,

[Hearts] appears when [4] is shown.

Step 4: Retract your gestures, and the playing cards disappear.

The video is attached in the file.