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KUIS 2 PCVK

OLEH KELOMPOK 5

start

PCVK

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PCVK

Pra Processing

Pra Processing memiliki beberapa tujuan, diantaranya :

- Menyiapkan gambar atau data masukan untuk tahapan berikutnya dengan menghilangkan noise, meningkatkan kontras, dan melakukan penyesuaian lainnya. **contohnya** Normalisasi intensitas piksel, filtrasi untuk mengurangi noise, perataan histogram, dll.

- Menemukan area atau objek yang menarik dalam gambar. **contohnya** Deteksi tepi, deteksi sudut, atau pemfilteran untuk menyoroti objek dari latar belakang.

- Memecah gambar menjadi bagian-bagian atau segmen yang berbeda agar lebih mudah untuk dianalisis. **contohnya** Clustering (seperti K-means), thresholding, segmentasi wilayah, dll.

- Mengidentifikasi atau mengklasifikasikan objek atau pola yang dihasilkan setelah lokalisasi dan segmentasi. **contohnya** Penggunaan model pembelajaran mesin untuk mengenali pola atau objek tertentu, seperti pengenalan karakter pada citra teks atau pengenalan wajah pada gambar.

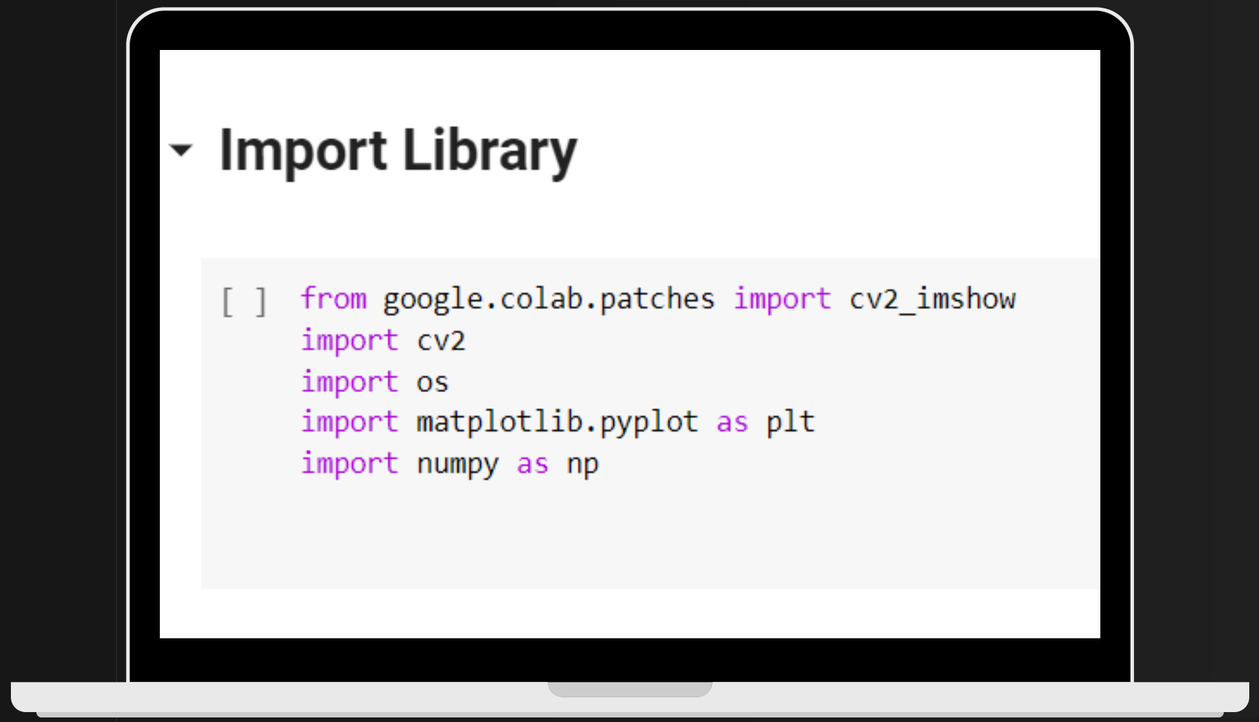
PCVK

CODE PROG

CODE PROGRAM DAN RUNNING

start

PCVK



Import Library

PCVK

Load Data

Load Data

```
[ ] from google.colab import drive
    drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

```
[ ] !pip install mtcnn
```

```
Collecting mtcnn
  Downloading mtcnn-0.1.1-py3-none-any.whl (2.3 MB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 2.3/2.3 MB 13.3 MB/s eta 0:00:00
Requirement already satisfied: keras>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from mtcnn) (2.14.0)
Requirement already satisfied: opencv-python>=4.1.0 in /usr/local/lib/python3.10/dist-packages (from mtcnn) (4.8.0.76)
Requirement already satisfied: numpy>=1.21.2 in /usr/local/lib/python3.10/dist-packages (from opencv-python>=4.1.0->mtcnn) (1.23.5)
Installing collected packages: mtcnn
Successfully installed mtcnn-0.1.1
```

```
[ ] from mtcnn.mtcnn import MTCNN
```

PCVK

Preprocessing

```python
def load_image(image_path_mtcnn):
    return cv2.imread(image_path_mtcnn)

def preprocces_image(image):
  # mengubah image menjadi grayscale
  gray = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

  # menggunakan GaussianBlur untuk mengurangi noise
  blur = cv2.GaussianBlur(gray, (5,5), 0)
  blur = cv2.GaussianBlur(blur, (5,5), 0)
  blur = cv2.GaussianBlur(blur, (5,5), 0)
  blur = cv2.GaussianBlur(blur, (5,5), 0)

  # Tresholding
  th, threshed = cv2.threshold(blur, 0, 255, cv2.THRESH_OTSU + cv2.THRESH_BINARY)

  # Opening
  closing_image = cv2.morphologyEx(threshed, cv2.MORPH_CLOSE, (5,5))
  dilate = cv2.dilate(closing_image, (5,5))

  return dilate
```

Preprocessing

Segmentation

Segmentation

```
[ ]  def segmentasi(image):
       #reshape array ke bentuk 2D
       pixel_values = image.reshape((-1, 3))
       # convert to float
       pixel_values = np.float32(pixel_values)

       criteria = (cv2.TERM_CRITERIA_EPS + cv2.TERM_CRITERIA_MAX_ITER, 100, 0.2)

       k = 2
       _, labels, (centers) = cv2.kmeans(pixel_values, k, None, criteria, 10, cv2.KMEANS_RANDOM_CENTERS)
       #konversi titik centroid kedalam integer
       centers = np.uint8(centers)
       #flattening label array
       labels = labels.flatten()
       #konversi warna pixel asli kewarna dari tiap centroidnya
       segmented_image = centers[labels.flatten()]
       # reshape ke bentuk image asli
       segmented_image = segmented_image.reshape(image.shape)

       return segmented_image
```

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Face Detection 1

Face Detection

[3] 1s

```python
def detect_face(image):
    marked = image.copy()
    face_cascade = cv2.CascadeClassifier(cv2.data.haarcascades + 'haarcascade_frontalface_default.xml')
    roi = face_cascade.detectMultiScale(marked, scaleFactor=1.2, minNeighbors=9, minSize=(30, 30))

    for (x, y, w, h) in roi:
        cv2.rectangle(marked, (x, y), (x+w, y+h), (255, 255, 255), 4)

    return marked
```

[4] 0s

```python
def crop_image(image, face):
    face_cascade = cv2.CascadeClassifier(cv2.data.haarcascades + 'haarcascade_frontalface_default.xml')
    roi = face_cascade.detectMultiScale(face, scaleFactor=1.2, minNeighbors=9, minSize=(30, 30))
    for i, (x, y, w, h) in enumerate(roi, 1):
        croped_image = image[y:y+h, x:x+w]

    return croped_image
```

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Face Detection 2

```
[5] def display(image, preprocessing, segmentation, detect, crop):

      plt.figure(figsize=(12, 4))

    # Original Image
      plt.subplot(1, 5, 1)
      plt.imshow(cv2.cvtColor(image, cv2.COLOR_BGR2RGB))
      plt.title('Original Image')
      plt.axis('off')

    # preprocessing
      plt.subplot(1, 5, 2)
      plt.imshow(cv2.cvtColor(preprocessing, cv2.COLOR_BGR2RGB))
      plt.title('Preprocessing')
      plt.axis('off')

    # result Segmentasi
      plt.subplot(1, 5, 3)
      plt.imshow(cv2.cvtColor(segmentation, cv2.COLOR_BGR2RGB))
      plt.title('Segmentation')
      plt.axis('off')

    # Gambar Faces Marked
      plt.subplot(1, 5, 4)
      plt.imshow(cv2.cvtColor(detect, cv2.COLOR_BGR2RGB))
      plt.title('Image with Faces Marked')
      plt.axis('off')

    # Gambar Wajah yang Dipotong
      plt.subplot(1, 5, 5)
      plt.imshow(cv2.cvtColor(crop, cv2.COLOR_BGR2RGB))
```

```
# Gambar Wajah yang Dipotong
  plt.subplot(1, 5, 5)
  plt.imshow(cv2.cvtColor(crop, cv2.COLOR_BGR2RGB))
  plt.title('Hasil Crop')
  plt.axis('off')

# Show the plot
  plt.show()
```

Loading...

PCVK

Face Detection 3

```python
def process_image(image_path_mtcnn):
    # Load Gambar
    image = load_image(image_path_mtcnn)

    # Preprocess Image
    processed_image = preprocces_image(image)

    segment = segmentasi(processed_image)

    # Detect Faces
    faces = detect_face(segment)

    # Display Results
    crop = crop_image(image, faces)
    display(image, processed_image, segment, faces, crop)
```

```python
import cv2
import numpy as np

def segmentasi(image_path):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Reshape the image to 2D array
    pixel_values = image.reshape((-1, 3))

    # Convert to float
    pixel_values = np.float32(pixel_values)

    # Your further processing goes here

# Example usage
image_path = '/content/drive/MyDrive/PCVK/KTP FARIZ.jpg'
segmentasi(image_path)
```

PCVK

Face Detection 4

```python
import cv2
import matplotlib.pyplot as plt

def segmentasi(image_path):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Display the original image using matplotlib
    plt.imshow(cv2.cvtColor(image, cv2.COLOR_BGR2RGB))
    plt.axis('off')
    plt.show()

# Example usage
image_path = '/content/drive/MyDrive/PCVK/KTP FARIZ.jpg'
segmentasi(image_path)
```

PCVK

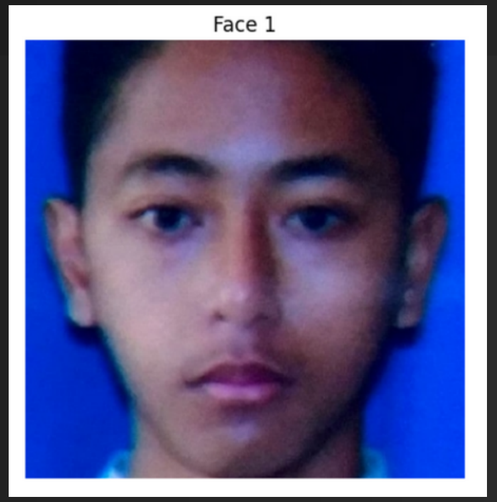
Lokalisasi

```python
import cv2
import numpy as np
import matplotlib.pyplot as plt

def segmentasi(image_path):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Convert the image to grayscale for face detection
    gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

    # Load the pre-trained Haar Cascade classifier for face detection
    face_cascade = cv2.CascadeClassifier(cv2.data.haarcascades + 'haarcascade_frontalface_default.xml')

    # Perform face detection
    faces = face_cascade.detectMultiScale(gray_image, scaleFactor=1.3, minNeighbors=5)

    # Draw rectangles around the detected faces
    for (x, y, w, h) in faces:
        cv2.rectangle(image, (x, y), (x+w, y+h), (255, 0, 0), 2)

    # Display the original image with face detection using matplotlib
    plt.imshow(cv2.cvtColor(image, cv2.COLOR_BGR2RGB))
    plt.axis('off')
    plt.show()

# Example usage
image_path = '/content/drive/MyDrive/PCVK/KTP FARIZ.jpg'
segmentasi(image_path)
```

PCVK

Lokalisasi 2

```
[ ]
import cv2
import numpy as np
import matplotlib.pyplot as plt

def crop_faces(image_path, output_folder):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Convert the image to grayscale for face detection
    gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

    # Load the pre-trained Haar Cascade classifier for face detection
    face_cascade = cv2.CascadeClassifier(cv2.data.haarcascades + 'haarcascade_frontalface_default.xml')

    # Perform face detection
    faces = face_cascade.detectMultiScale(gray_image, scaleFactor=1.3, minNeighbors=5)

    # Crop and save each detected face
    for i, (x, y, w, h) in enumerate(faces):
        # Crop the face region
        face_crop = image[y:y+h, x:x+w]

        # Save the cropped face
        face_filename = f"{output_folder}/face_{i+1}.jpg"
        cv2.imwrite(face_filename, face_crop)
```




```
    # Display the cropped face
    plt.imshow(cv2.cvtColor(face_crop, cv2.COLOR_BGR2RGB))
    plt.axis('off')
    plt.title(f"Face {i+1}")
    plt.show()

# Example usage
image_path = '/content/drive/MyDrive/PCVK/KTP FARIZ.jpg'
output_folder = '/content/drive/MyDrive/PCVK/cropped_faces'
crop_faces(image_path, output_folder)
```

PCVK

```python
import cv2
import numpy as np

def segmentasi(image_path):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Reshape the image to 2D array
    pixel_values = image.reshape((-1, 3))

    # Convert to float
    pixel_values = np.float32(pixel_values)

    # Your further processing goes here

# Example usage
image_path = '/content/drive/MyDrive/PCVK/KTP HAIKAL.jpg'
segmentasi(image_path)
```

```python
[ ] import cv2
import matplotlib.pyplot as plt

def segmentasi(image_path):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Display the original image using matplotlib
    plt.imshow(cv2.cvtColor(image, cv2.COLOR_BGR2RGB))
    plt.axis('off')
    plt.show()

# Example usage
image_path = '/content/drive/MyDrive/PCVK/KTP HAIKAL.jpg'
segmentasi(image_path)
```

Lokalisasi 3

PCVK

Lokalisasi 4

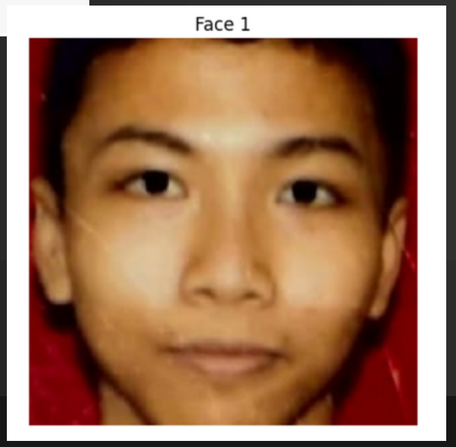
```python
import cv2
import numpy as np
import matplotlib.pyplot as plt

def segmentasi(image_path):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Convert the image to grayscale for face detection
    gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

    # Load the pre-trained Haar Cascade classifier for face detection
    face_cascade = cv2.CascadeClassifier(cv2.data.haarcascades + 'haarcascade_frontalface_default.xml')

    # Perform face detection
    faces = face_cascade.detectMultiScale(gray_image, scaleFactor=1.3, minNeighbors=5)

    # Draw rectangles around the detected faces
    for (x, y, w, h) in faces:
        cv2.rectangle(image, (x, y), (x+w, y+h), (255, 0, 0), 2)

    # Display the original image with face detection using matplotlib
    plt.imshow(cv2.cvtColor(image, cv2.COLOR_BGR2RGB))
    plt.axis('off')
    plt.show()
```

```python
# Example usage
image_path = '/content/drive/MyDrive/PCVK/KTP HAIKAL.jpg'
segmentasi(image_path)
```

PCVK

Lokalisasi 5

```python
import cv2
import numpy as np
import matplotlib.pyplot as plt

def crop_faces(image_path, output_folder):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Convert the image to grayscale for face detection
    gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

    # Load the pre-trained Haar Cascade classifier for face detection
    face_cascade = cv2.CascadeClassifier(cv2.data.haarcascades + 'haarcasc

    # Perform face detection
    faces = face_cascade.detectMultiScale(gray_image, scaleFactor=1.3, minNeighbors=5)

    # Crop and save each detected face
    for i, (x, y, w, h) in enumerate(faces):
        # Crop the face region
        face_crop = image[y:y+h, x:x+w]

        # Save the cropped face
        face_filename = f"{output_folder}/face_{i+1}.jpg"
        cv2.imwrite(face_filename, face_crop)

        # Display the cropped face
        plt.imshow(cv2.cvtColor(face_crop, cv2.COLOR_BGR2RGB))
        plt.axis('off')
        plt.title(f"Face {i+1}")
        plt.show()

# Example usage
image_path = '/content/drive/MyDrive/PCVK/KTP HAIKAL.jpg'
output_folder = '/content/drive/MyDrive/PCVK/cropped_faces'
crop_faces(image_path, output_folder)
```



PCVK

Lokalisasi 6

```python
import cv2
import numpy as np

def segmentasi(image_path):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Reshape the image to 2D array
    pixel_values = image.reshape((-1, 3))

    # Convert to float
    pixel_values = np.float32(pixel_values)

    # Your further processing goes here

# Example usage
image_path = '/content/drive/MyDrive/PCVK/Ktp.jpg'
segmentasi(image_path)
```

```python
import cv2
import matplotlib.pyplot as plt

def segmentasi(image_path):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Display the original image using matplotlib
    plt.imshow(cv2.cvtColor(image, cv2.COLOR_BGR2RGB))
    plt.axis('off')
    plt.show()

# Example usage
image_path = '/content/drive/MyDrive/PCVK/Ktp.jpg'
segmentasi(image_path)
```

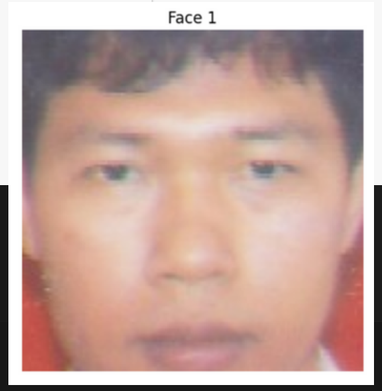
PCVK

Lokalisasi 7

```python
def segmentasi(image_path):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Convert the image to grayscale
    gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

    # Load the pre-trained Haar Cascade classifier for face detection
    face_cascade = cv2.CascadeClassifier(cv2.data.haarcascades + 'haarcascade_frontalface_default.xml')

    # Perform face detection
    faces = face_cascade.detectMultiScale(gray_image, scaleFactor=1.3, minNeighbors=5)

    # Draw rectangles around the detected faces
    for (x, y, w, h) in faces:
        cv2.rectangle(image, (x, y), (x+w, y+h), (255, 0, 0), 2)

    # Display the original image with face detection using matplotlib
    plt.imshow(cv2.cvtColor(image, cv2.COLOR_BGR2RGB))
    plt.axis('off')
    plt.show()

# Example usage
image_path = '/content/drive/MyDrive/PCVK/Ktp.jpg'
segmentasi(image_path)
```

```
int: cv2.COLOR_BGR2GRAY
```

```
6
```




```python
def crop_faces(image_path, output_folder):
    # Load the image
    image = cv2.imread(image_path)

    # Check if the image is loaded successfully
    if image is None:
        print(f"Error: Unable to load image at {image_path}")
        return

    # Convert the image to grayscale for face detection
    gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

    # Load the pre-trained Haar Cascade classifier for face detection
    face_cascade = cv2.CascadeClassifier(cv2.data.haarcascades + 'haarcascade_frontalface_default.xml')

    # Perform face detection
    faces = face_cascade.detectMultiScale(gray_image, scaleFactor=1.3, minNeighbors=5)

    # Crop and save each detected face
    for i, (x, y, w, h) in enumerate(faces):
        # Crop the face region
        face_crop = image[y:y+h, x:x+w]

        # Save the cropped face
        face_filename = f"{output_folder}/face_{i+1}.jpg"
        cv2.imwrite(face_filename, face_crop)

            # Display the cropped face
            plt.imshow(cv2.cvtColor(face_crop, cv2.COLOR_BGR2RGB))
            plt.axis('off')
            plt.title(f"Face {i+1}")
            plt.show()

    # Example usage
    image_path = '/content/drive/MyDrive/PCVK/Ktp.jpg'
    output_folder = '/content/drive/MyDrive/PCVK/cropped_faces'
    crop_faces(image_path, output_folder)
```

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THANKS

FOR YOUR ATTENTION

the end