Python les-materialen

Usage example of MediaPipe Hands Solution API in Python (see also http://solutions.mediapipe.dev/hands).

!pip install mediapipe

Upload any image that contains hand(s) to the Colab. We took two examples from the web: https://unsplash.com/photos/QyCH5jwrD\_A and https://unsplash.com/photos/mt2fyrdXxzk

from google.colab import files  
  
uploaded = files.upload()

import cv2  
from google.colab.patches import cv2\_imshow  
import math  
import numpy as np  
  
DESIRED\_HEIGHT = 480  
DESIRED\_WIDTH = 480  
def resize\_and\_show(image):  
 h, w = image.shape[:2]  
 if h < w:  
 img = cv2.resize(image, (DESIRED\_WIDTH, math.floor(h/(w/DESIRED\_WIDTH))))  
 else:  
 img = cv2.resize(image, (math.floor(w/(h/DESIRED\_HEIGHT)), DESIRED\_HEIGHT))  
 cv2\_imshow(img)  
  
# Read images with OpenCV.  
images = {name: cv2.imread(name) for name in uploaded.keys()}  
# Preview the images.  
for name, image in images.items():  
 print(name)   
 resize\_and\_show(image)

brooke-cagle-mt2fyrdXxzk-unsplash.jpg

png

kira-auf-der-heide-QyCH5jwrD\_A-unsplash.jpg

png

All MediaPipe Solutions Python API examples are under mp.solutions.

For the MediaPipe Hands solution, we can access this module as mp\_hands = mp.solutions.hands.

You may change the parameters, such as static\_image\_mode, max\_num\_hands, and min\_detection\_confidence, during the initialization. Run help(mp\_hands.Hands) to get more informations about the parameters.

import mediapipe as mp  
mp\_hands = mp.solutions.hands  
mp\_drawing = mp.solutions.drawing\_utils  
mp\_drawing\_styles = mp.solutions.drawing\_styles  
help(mp\_hands.Hands)

# Run MediaPipe Hands.  
with mp\_hands.Hands(  
 static\_image\_mode=True,  
 max\_num\_hands=2,  
 min\_detection\_confidence=0.7) as hands:  
 for name, image in images.items():  
 # Convert the BGR image to RGB, flip the image around y-axis for correct   
 # handedness output and process it with MediaPipe Hands.  
 results = hands.process(cv2.flip(cv2.cvtColor(image, cv2.COLOR\_BGR2RGB), 1))  
  
 # Print handedness (left v.s. right hand).  
 print(f'Handedness of {name}:')  
 print(results.multi\_handedness)  
  
 if not results.multi\_hand\_landmarks:  
 continue  
 # Draw hand landmarks of each hand.  
 print(f'Hand landmarks of {name}:')  
 image\_hight, image\_width, \_ = image.shape  
 annotated\_image = cv2.flip(image.copy(), 1)  
 for hand\_landmarks in results.multi\_hand\_landmarks:  
 # Print index finger tip coordinates.  
 print(  
 f'Index finger tip coordinate: (',  
 f'{hand\_landmarks.landmark[mp\_hands.HandLandmark.INDEX\_FINGER\_TIP].x \* image\_width}, '  
 f'{hand\_landmarks.landmark[mp\_hands.HandLandmark.INDEX\_FINGER\_TIP].y \* image\_hight})'  
 )  
 mp\_drawing.draw\_landmarks(  
 annotated\_image,  
 hand\_landmarks,  
 mp\_hands.HAND\_CONNECTIONS,  
 mp\_drawing\_styles.get\_default\_hand\_landmarks\_style(),  
 mp\_drawing\_styles.get\_default\_hand\_connections\_style())  
 resize\_and\_show(cv2.flip(annotated\_image, 1))

Handedness of brooke-cagle-mt2fyrdXxzk-unsplash.jpg:  
[classification {  
 index: 0  
 score: 0.9822625517845154  
 label: "Left"  
}  
, classification {  
 index: 1  
 score: 0.9344392418861389  
 label: "Right"  
}  
]  
Hand landmarks of brooke-cagle-mt2fyrdXxzk-unsplash.jpg:  
Index finger tip coordinate: ( 417.12775802612305, 521.6625137329102)  
Index finger tip coordinate: ( 121.85909080505371, 280.0408687591553)

png

Handedness of kira-auf-der-heide-QyCH5jwrD\_A-unsplash.jpg:  
[classification {  
 index: 0  
 score: 0.8767261505126953  
 label: "Left"  
}  
]  
Hand landmarks of kira-auf-der-heide-QyCH5jwrD\_A-unsplash.jpg:  
Index finger tip coordinate: ( 226.7688331604004, 211.63099694252014)

png

# Run MediaPipe Hands and plot 3d hands world landmarks.  
with mp\_hands.Hands(  
 static\_image\_mode=True,  
 max\_num\_hands=2,  
 min\_detection\_confidence=0.7) as hands:  
 for name, image in images.items():  
 # Convert the BGR image to RGB and process it with MediaPipe Hands.  
 results = hands.process(cv2.cvtColor(image, cv2.COLOR\_BGR2RGB))  
 # Draw hand world landmarks.  
 print(f'Hand world landmarks of {name}:')  
 if not results.multi\_hand\_world\_landmarks:  
 continue  
 for hand\_world\_landmarks in results.multi\_hand\_world\_landmarks:  
 mp\_drawing.plot\_landmarks(  
 hand\_world\_landmarks, mp\_hands.HAND\_CONNECTIONS, azimuth=5)

Hand world landmarks of brooke-cagle-mt2fyrdXxzk-unsplash.jpg:

png

png

Hand world landmarks of kira-auf-der-heide-QyCH5jwrD\_A-unsplash.jpg:

png