ai_notebook

September 27, 2024

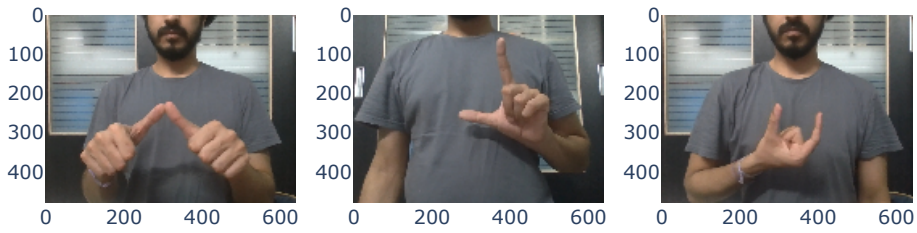
[1]:
```
import cv2
import plotly.express as px
import plotly.graph_objects as go
from plotly.subplots import make_subplots
import mediapipe as mp
import plotly.io as pio
import custom_theme

import warnings
warnings.filterwarnings('ignore')
```

[2]:
```
pio.templates.default = custom_theme.my_theme
pio.renderers.default = "notebook_connected+pdf"
```

1 DATA CREATION

[3]:
```
def plot_image(path):
    # Read the image
    img = cv2.imread(path)
    img_rgb = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
    fig = px.imshow(img_rgb)
    return fig
```

[4]:
```
fig = make_subplots(rows=1, cols=3, subplot_titles=['Letter A', 'Letter L',␣
 ↪'Letter U'])

for idx, x in enumerate(['a','l','u']):
    image_fig = plot_image('./data/' + x + '/0.jpg')
    image_trace = image_fig.data[0]
    fig.add_trace(image_trace, row=1, col=idx+1)

fig.update_layout(title_text='Raw Training Images', showlegend=False)
fig.show()
```



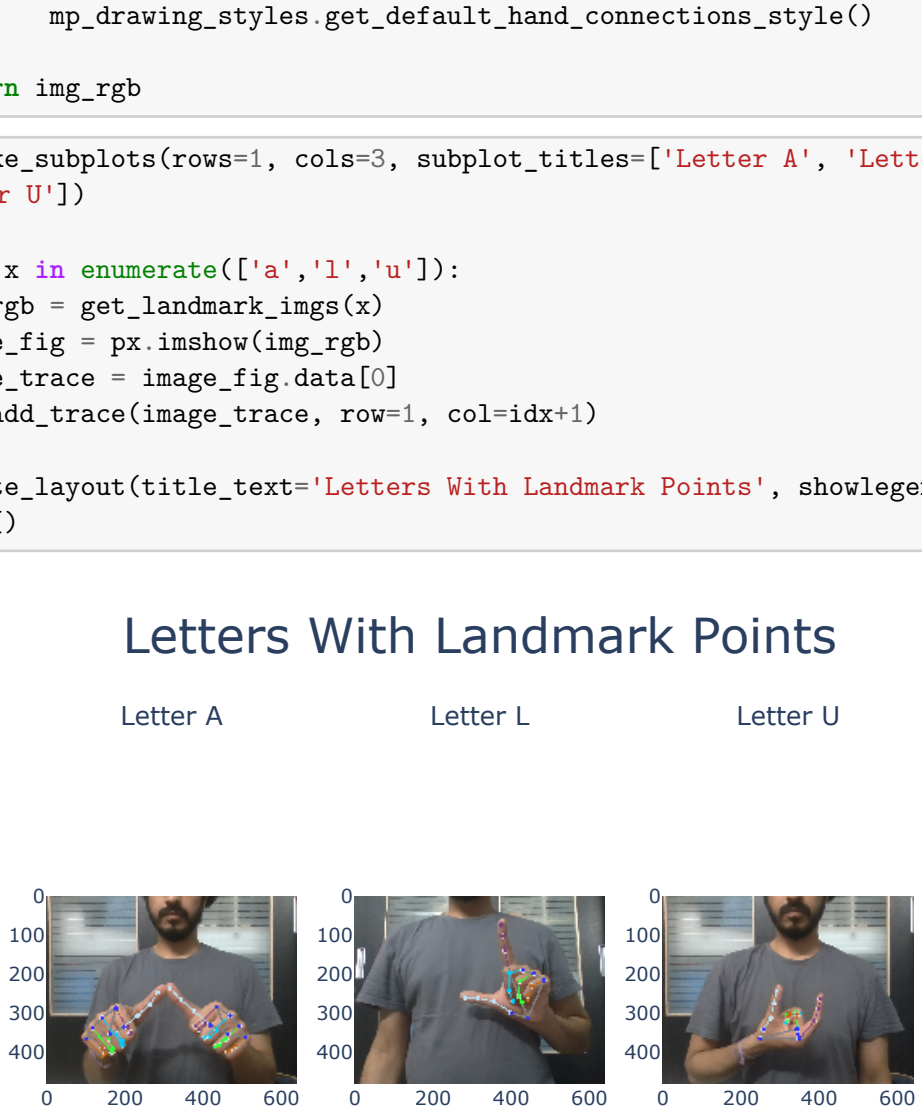
2 DATA EXTRACTION

[5]:
```
#Initialising mediapipe landmark tracing

mp_hands = mp.solutions.hands
mp_drawing = mp.solutions.drawing_utils
mp_drawing_styles = mp.solutions.drawing_styles
hands = mp_hands.Hands(static_image_mode=True, min_detection_confidence=0.1,␣
↪min_tracking_confidence=0.1)
```

[6]:
```
def get_landmark_imgs(letter):

    img = cv2.imread('data/' + letter + '/0.jpg')
    img_rgb = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)

    results = hands.process(img_rgb)

    for hand_landmarks in results.multi_hand_landmarks:
        mp_drawing.draw_landmarks(
            img_rgb,
            hand_landmarks,
```

```
            mp_hands.HAND_CONNECTIONS,
            mp_drawing_styles.get_default_hand_landmarks_style(),
            mp_drawing_styles.get_default_hand_connections_style()
        )
    return img_rgb
```

[7]:
```
fig = make_subplots(rows=1, cols=3, subplot_titles=['Letter A', 'Letter L',␣
 ↪'Letter U'])

for idx, x in enumerate(['a','l','u']):
    img_rgb = get_landmark_imgs(x)
    image_fig = px.imshow(img_rgb)
    image_trace = image_fig.data[0]
    fig.add_trace(image_trace, row=1, col=idx+1)

fig.update_layout(title_text='Letters With Landmark Points', showlegend=False)
fig.show()
```



3 DATA PREDICTION

[8]:
```
fig = make_subplots(rows=1, cols=3, subplot_titles=['Letter A', 'Letter L',␣
 ↪'Letter U'])

for idx, x in enumerate(['a','l','u']):
    image_fig = plot_image('./predictions/' + x + '/0.jpg')
    image_trace = image_fig.data[0]
    fig.add_trace(image_trace, row=1, col=idx+1)

fig.update_layout(title_text='Detected Letters by using AI', showlegend=False)
fig.show()
```