

File Explorer window showing a folder named 'rib' containing 22 items. The items are organized into a grid of 4 columns and 6 rows. The first row contains 4 items: 'rib_0_5234', 'rib_0_3721', 'rib_0_8533', and 'rib_0_3917'. The second row contains 4 items: 'rib_0_3583', 'rib_0_8345', 'rib_0_9552', and 'rib_0_7632'. The third row contains 4 items: 'rib_0_2986', 'rib_0_3403', 'rib_0_3884', and 'rib_0_9322'. The fourth row contains 4 items: 'rib_0_6647', 'rib_0_5833', 'rib_0_9847', and 'rib_0_1098'. The items are small thumbnail images of a person in a white shirt and green pants, standing in a field.

JupyterLab window showing a code editor with the following code:

```
[*]:  
#image Augmentation  
#creating different images with different sizes from a single image  
from tensorflow.keras.preprocessing.image import ImageDataGenerator,array_to_img,  
datagen = ImageDataGenerator(  
    rotation_range = 40,  
    width_shift_range=0.2,  
    height_shift_range=0.2,  
    shear_range = 0.2,  
    zoom_range = 0.2,  
    horizontal_flip = True,  
    fill_mode='nearest',  
    brightness_range = (0.5, 1.5))  
  
img = load_img(r"C:\Users\ANGELIN\Downloads\image_123650291.JPG")  
x = img_to_array(img) # to get shape (3,150,150)  
x = x.reshape((1,) + x.shape) # to get 4d  
  
i=0  
for batch in datagen.flow(x, batch_size=1,save_dir=r"C:\Users\ANGELIN\Download  
i+=1  
if i>100:  
    break
```

Below the code editor, a small window titled 'shifted down and right' displays a portrait of a man with dark hair and a beard, wearing a dark suit, white shirt, and red tie. The image is slightly shifted down and to the right.

Jupyter Notebook window showing a code editor with the following code:

```
[*]: #image translation (applying shifting transformation over given image- )  
  
import cv2  
import numpy as np  
import imutils # imutils - image utilities library  
jeep = cv2.imread(r"C:\Users\ANGELIN\Downloads\LEBIN coat add (1).jpg")  
# create translation matrix  
TM = np.float32([[1,0,60],[0,1,60]])  
shift = cv2.warpAffine(jeep,TM,(jeep.shape[1],jeep.shape[0]))# 1 - width 0-height  
# warpAffine method is used to apply shifting transformation(moving right/left/right & up  
cv2.imshow('shfited down and right',shift)  
cv2.waitKey(0)  
cv2.destroyAllWindows()
```

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```
TM = np.float32([[1,0,60],[0,1,60]])
shift = cv2.warpAffine(jeep,TM,(jeep.shape[1],jeep.shape[0]))# 1 - width
# warpAffine method is used to apply shifting transformation(moving right)
cv2.imshow('shifted down and right',shift)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

```
[7]: def translate(jeep,shiftX,shiftY):
      TM = np.float32([[1,0,shiftX],[0,1,shiftY]])
      shift = cv2.warpAffine(jeep,TM,(jeep.shape[1],jeep.shape[0]))
      return shift
```

```
[*]: shift1 = imutils.translate(jeep,0,100)
      cv2.imshow('shifted down',shift1)
      cv2.waitKey(0)
      cv2.destroyAllWindows()
```

```
[ ]:
```

shifted down



Python 3 (ipykernel)

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```
TM = np.float32([[1,0,60],[0,1,60]])
shift = cv2.warpAffine(jeep,TM,(jeep.shape[1],jeep.shape[0]))# 1 - width 0-height
# warpAffine method is used to apply shifting transformation(moving right/left/right &
cv2.imshow('shifted down and right',shift)
cv2.waitKey(0)
cv2.destroyAllWindows()
```


```
[7]: def translate(jeep,shiftX,shiftY):
      TM = np.float32([[1,0,shiftX],[0,1,shiftY]])
      shift = cv2.warpAffine(jeep,TM,(jeep.shape[1],jeep.shape[0]))
      return shift
```

```
[8]: shift1 = imutils.translate(jeep,0,100)
      cv2.imshow('shifted down',shift1)
      cv2.waitKey(0)
      cv2.destroyAllWindows()
```

```
[*]: shift1 = imutils.translate(jeep,100,0)
      cv2.imshow('shifted only right',shift1)
      cv2.waitKey(0)
      cv2.destroyAllWindows()
```

```
[ ]:
```

shifted only right



Python 3 (ipykernel)

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```
[7]: def translate(jpeg,shiftX,shiftY):  
    TM = np.float32([[1,0,shiftX],[0,1,shiftY]])  
    shift = cv2.warpAffine(jpeg,TM,(jpeg.shape[1],jpeg.shape[0]))  
    return shift  
  
[8]: shift1 = imutils.translate(jpeg,0,100)  
    cv2.imshow('shifted down',shift1)  
    cv2.waitKey(0)  
    cv2.destroyAllWindows()  
  
[9]: shift1 = imutils.translate(jpeg,100,0)  
    cv2.imshow('shifted only right',shift1)  
    cv2.waitKey(0)  
    cv2.destroyAllWindows()  
  
[*]: shift2 = imutils.translate(jpeg,-60,-60)  
    cv2.imshow('shifted up and left',shift2)  
    cv2.waitKey(0)  
    cv2.destroyAllWindows()  
  
[ ]:
```

shifted up and left



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```
[7]: def translate(jpeg,shiftX,shiftY):  
    TM = np.float32([[1,0,shiftX],[0,1,shiftY]])  
    shift = cv2.warpAffine(jpeg,TM,(jpeg.shape[1],jpeg.shape[0]))  
    return shift  
  
[8]: shift1 = imutils.translate(jpeg,0,100)  
    cv2.imshow('shifted down',shift1)  
    cv2.waitKey(0)  
    cv2.destroyAllWindows()  
  
[9]: shift1 = imutils.translate(jpeg,100,0)  
    cv2.imshow('shifted only right',shift1)  
    cv2.waitKey(0)  
    cv2.destroyAllWindows()  
  
[10]: shift2 = imutils.translate(jpeg,-60,-60)  
    cv2.imshow('shifted up and left',shift2)  
    cv2.waitKey(0)  
    cv2.destroyAllWindows()  
  
[*]: shift3 = imutils.translate(jpeg,-60,60)  
    cv2.imshow('shifted down and left',shift3)  
    cv2.waitKey(0)  
    cv2.destroyAllWindows()  
  
[ ]:
```

shifted down and left



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cv2.destroyAllWindows()

```
[9]: shift1 = imutils.translate(jeep,100,0)
cv2.imshow('shifted only right',shift1)
cv2.waitKey(0)
cv2.destroyAllWindows()


[10]: shift2 = imutils.translate(jeep,-60,-60)
cv2.imshow('shifted up and left',shift2)
cv2.waitKey(0)
cv2.destroyAllWindows()

[11]: shift3 = imutils.translate(jeep,-60,60)
cv2.imshow('shifted down and left',shift3)
cv2.waitKey(0)
cv2.destroyAllWindows()

[*]: shift4 = imutils.translate(jeep,60,-60)
cv2.imshow('shifted up and right',shift4)
cv2.waitKey(0)
cv2.destroyAllWindows()

[ ]:
```

shifted up and right



Python 3 (ipykernel)

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