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Image Translation using OpenCV | Python

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Translation refers to the rectilinear shift of an object i.e. an image from one location to another. If we know the amount of shift in horizontal and the vertical direction, say (tx, ty) then we can make a transformation matrix e.g. $\begin{bmatrix} 1 & 0 & tx \\ 0 & 1 & ty \end{bmatrix}$

where tx denotes the shift along the x-axis and ty denotes shift along the y-axis i.e. the number of pixels by which we need to shift about in that direction.

Now, we can use the `cv2.wrapAffine()` function to implement these translations. This function requires a 2×3 array. The numpy array should be of float type.

Below is the Python code for Image Translation:

```python
import cv2
import numpy as np

image = cv2.imread('C:\\gfg\\tomatoes.jpg')

# Store height and width of the image
height, width = image.shape[:2]

quarter_height, quarter_width = height / 4, width / 4

T = np.float32([[1, 0, quarter_width], [0, 1, quarter_height]])

# We use warpAffine to transform
# the image using the matrix, T
img_translation = cv2.warpAffine(image, T, (width, height))

cv2.imshow("Originalimage", image)
cv2.imshow('Translation', img_translation)
cv2.waitKey()
```

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Advantages/application of image translation are:

- Hiding a part of the image
- Cropping an image
- Shifting an image
- Animating an image using image translations in loop.

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