A02 Transformations

By Kaden Ramirez

Input images

300 X 168

650 X 433

1000 X 750

1300 X 1300

Y is it flipped?

```
h,w=pug.shape[:2]
M= np.float64([[-1,0,w],[0,1,0],[0,0,1]])
out=cv2.warpPerspective(pug,M,(w,h))
```

Original

Flipped

30 Degree Rotation

```
h,w=nug.shape[:2]
angle=math.pi*30/180
T1=np.float64([[1,0,-w],[0,1,-h],[0,0,1]])
T2=np.float64([[1,0,w],[0,1,h],[0,0,1]])
R=np.float64([[np.cos(angle),-np.sin(angle),0],[np.sin(angle),np.cos(angle),0],[0,0,1]])
M=T2@R@T1
nugR=cv2.warpPerspective(nug,M,(w,h))
```

Original

Rotated

Framed 30 Degree Rotation

```
T1=np.float64([[1,0,-w],[0,1,-h],[0,0,1]])
T2=np.float64([[1,0,w],[0,1,h],[0,0,1]])
R=np.float64([[np.cos(angle),-np.sin(angle),0],[np.sin(angle),np.cos(angle),0],[0,0,1]])
newX=(h*np.sin(angle))+(w*np.cos(angle))
newY=(h*np.cos(angle))+(w*np.sin(angle))
T3=np.float64([[1,0,-(newX-w)/(17/16)],[0,1,(newY-h)],[0,0,1]])
M2=T3@T2@R@T1
pugR=cv2.warpPerspective(pug,M2,(int(newX),int(newY)))
```

Framed: 344 X 296

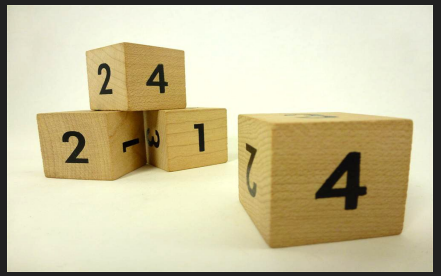
Original

Feeling Square

```
hPug,wPug=pug.shape[:2]
cubeh,cubew=cube.shape[:2]
srcPointsPug=np.float32([[[0,0],[wPug,0],[wPug,hPug],[0,hPug]]])
dstPointsPug=np.float32([[[625,335],[955,325],[925,640],[620,680]]])
MPug=cv2.getPerspectiveTransform(srcPointsPug, dstPointsPug)

pugPerspective=cv2.warpPerspective(pug,MPug,(cubew,cubeh))
show(pugPerspective)
blank=pug*0+255
blankPerspective=cv2.warpPerspective(blank,MPug,(cubew,cubeh))
p=blankPerspective/255.0
cube=np.uint8(pugPerspective*p+cube*(1-p))
```

Original Image(s)



Squared Images

Flattened Puffs

```
blank=puffs*0
h,w=puffs.shape[:2]
srcPoints=np.float32([[[1030,65],[350,110],[355,1265],[1030,1190]]])
dstPoints=np.float32([[[0,0],[w,0],[w,h],[0,h]]])
M=cv2.getPerspectiveTransform(srcPoints, dstPoints)
flatPerspective=cv2.warpPerspective(puffs,M,(w,h))
blankPerspective=cv2.warpPerspective(puffs,M,(w,h))
p=blankPerspective/255.0
blank=np.uint8(flatPerspective*p+blank*(1-p))
```

Original Puffs

Flattened Puffs