

A05 Seam Carving

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Input Image

1177x1600



Energy Map

```
edges=getEdgeImage(img)  
kernel=np.ones(3,np.float64)  
for i in range(1,len(edges)):
```

```
    minAbove=cv2.erode(edges[i-1],kernel).T[0]  
    edges[i]+=minAbove
```



Finding and Highlighting Seams Code (Horizontal and Vertical)

Seam Highlighter

```
def drawSeam(img,seam,color=255):  
    for x,y in seam:  
        img[y,x]=color
```

Seam Finder

```
energyMap=getEnergyMap(img)  
y=len(energyMap)-1  
x=np.argmin(energyMap[y])  
seam=[(x,y)]  
while len(seam)<len(energyMap):  
    x,y=seam[-1]  
    newY=y-1  
    newX=x+np.argmin(energyMap[newY,x-1:x+2])-1  
    seam.append((newX,newY))
```

Highlighting Seams Images

Original



100 Horizontal and Vertical Highlights



Retarget Code

```
def reTarget(img,w=824,h=1120,tw=320,th=320):  
    while h!=th or w!=tw:  
        if h!=th:  
            img.removeHorizontalSeam()  
            img.show()  
            h-=1  
        elif w!=tw:  
            img.removeVerticleSeam()  
            img.show()  
            w-=1
```

240x320



Retarget Images

Retargeted 320x320



Retargeted 640x640

