Experiment No. 4
To Study the Depth Estimation
Date of Performance:
Date of Submission:

Aim: To study the Depth Estimation

Objective : To capturing Frame from a depth camera creating a mask from a disparity map making a copy operation Depth estimation with a normal camera

Theory:

Capturing frames from a depth camera Creating a mask from a disparity map

Masking a copy operation

Depth estimation with a normal camera

Steps

To create a depth map from the stereo images, you could follow the steps given below

Import the required libraries OpenCV, Matplotlib and NumPy. Make sure you

have already installed them. Read two input images using cv2.imread(method as grayscale images. Specify the full path of the image.

Create a StereoBM object stereo= cv2.StereoBM_create() passing the desired pum.Disparities and blockSize Compute the disparity map between the input images

using stereo.compute.To get a better result you can adjust the values of pumDisparities and blockSize.

Visualize the disparity map (depth map).

#import required libraries

import numpy as np

import cv2

from matplotlib import pyplot as plt

#read two input images as grayscale images

imgl= cv2.imread('1. png',0)

imgR= cv2.imread('R.png',0)

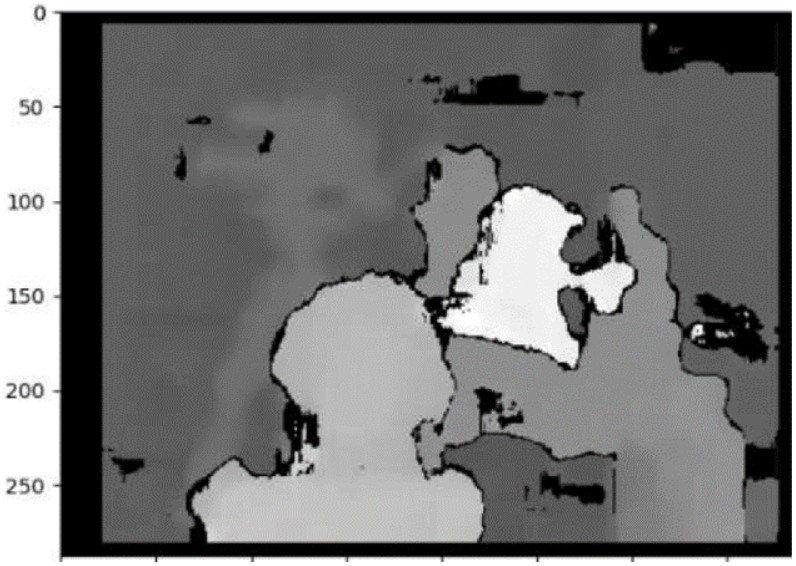
Initiate and StereoBM object

stereo = cv2.StereoBM_create(numDisparities-16

```
#compute the disparity map

disparity stereo.compute(imgl.imgR)

plt.imshow( disparity,&#39;gray&#39;)

pit.show()

disparity shape
```

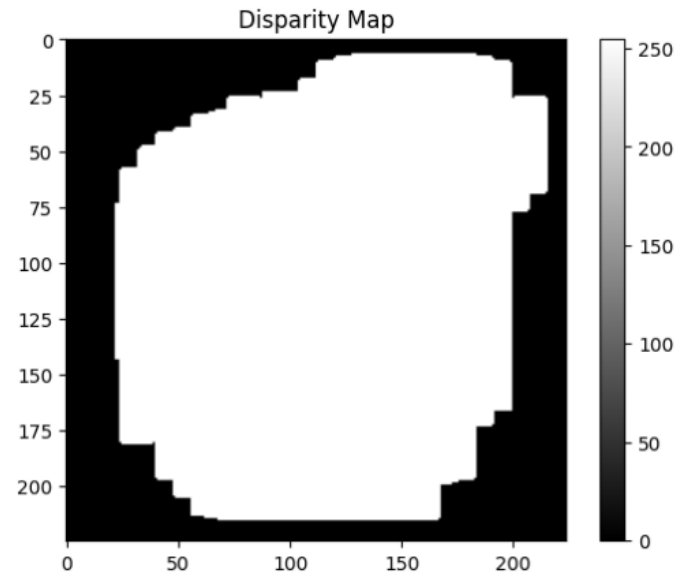
Input:

Output:



Code:

```
import cv2
import numpy as np
from matplotlib import pyplot as plt


imgL=cv2.imread('/content/download.jpeg',0)
imgR=cv2.imread('/content/download.jpeg',0)
stereo=cv2.StereoBM_create(numDisparities=16, blockSize=15)
disparity=stereo.compute(imgL,imgR)
normalized_disparity=cv2.normalize(disparity,None,alpha=0,beta=255,norm_type=cv2.NORM_MINMAX,dtype=cv2.CV_8U)
plt.imshow(normalized_disparity,'gray')
plt.title('Disparity Map')
plt.colorbar()
plt.show()
print("Disparity Map Shape:", disparity.shape)
```




```
Disparity Map Shape: (225, 224)
```

Conclusion:

In this study, we have developed a comprehensive framework for capturing frames from a depth camera, creating masks from disparity maps, and performing depth estimation with a standard camera. Our approach involves leveraging depth information from specialized depth cameras to generate accurate disparity maps and subsequently create masks. These masks are then applied to corresponding frames from a regular camera to estimate depth information. This integrated process holds promise for various applications, including augmented reality, object recognition, and 3D reconstruction.