

- Depth img  $\rightarrow$  give you depth (added Z-axis)
- Intensity values in image represent distance of object from viewpoint
- You Can Color Code imgs to visually represent the close, far objects
- Depth maps can be obtained using stereo Camera, <sup>①</sup>  
② Laser triangulation
- Depth maps used in 3D Vision Algorithms

disparity maps  $\rightarrow$   $\frac{2 \times \text{depth}}{\text{depth} \times 1920}$   $\rightarrow$  gray scale images in which each pixel value is the stereo disparity of surface

### Concept of Stereovision

- ① two images
- ② shot from different views
- ③ Result would be similar to be double
- ④ measure distance between pixels of same objects

Near object  $\rightarrow$  greater stereo than  $\rightarrow$  far obj  
brighter than

2 normal Cameras  $\rightarrow$  estimate relative distance to objects based on triangulation  $\rightarrow$  From different Camera perspective



Stereos vision

② one normal Camera  $\rightarrow$  move it over time to obtain different perspective



Structure from motion

Code

Initial values

$\rightarrow$   $f$   $W$   $H$   $D$   $S$   $L$   $U$   $S$   $L$   $U$   $S$

- ① min Disparity  $\rightarrow$  minimum possible disparity value  $\downarrow$
- ② num Disparities  $\rightarrow$  max disparity - min disparity (16)
- ③ block Size  $\rightarrow$  window size, odd, 3-11
- ④  $P_1$   $\rightarrow$  disparity smoothing
- ⑤  $P_2$   $\rightarrow$  disparity smoothing

$\rightarrow$   $f$   $W$   $H$   $D$   $S$   $L$   $U$   $S$   $L$   $U$   $S$

$P_1$   $\rightarrow$  gap between pixel and its neighbour (+1, -1)

$P_2$   $\rightarrow$  " " " " " " (1 < x)

$\rightarrow$  كل مكان البتة اكبر واهو



## function

StereoSGBM\_create(

minDisparity

numDisparity

blockSize

P1

P2)

①

SGBM → Semi Global Block Matching  
↳ Compute disparity maps

② Stereo.compute(img1, img2)

③ cv2.imshow('Disparity img',  
(disparity - mindisparity) / numDisparities)

Change block size

stereo.setBlockSize(cv2.getTrackPos)

block size,  
disparity

