

Early Draft, final version to come soon.

MATLAB session for Computer vision

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1 Read cursor position and values

```
[x,y] = ginput(n)
```

enables you to select n points from the current axes and returns the x - and y -coordinates in the column vectors x and y , respectively. You can press the Return key to terminate the input before entering n points.

```
[x,y] = ginput
```

gathers an unlimited number of points until you press the Return key.

Link:

[More information about this function](#)

2 Point operation

2.1 Thresholding an image (binarize) with specified threshold

Example: Suppose we have a image which size is 3×5 , we want to threshold this image using 0.5. The following code does it and we set all pixels which are larger than the threshold as 1, the pixels which are smaller or equal to the threshold as 0.

```
I = rand(3,5);  
I(I>0.5) = 1;  
I(I<=0.5) = 0;
```

2.2 Scaling intensity values.

Example: Suppose we have a image which size is 4×7 , the range of the image is $[0, 1]$, we want to rescale the image range to $[0, 255]$. The following is the code to do this.

```
I = rand(4,7);% original image which range is between 0 and 1  
Inew = I*255;
```

2.3 Others

Example: If we have two matrix (A, B) and we want to do component-wise matrix multiplication, we need to do the following. (The sizes of A, B are the same.)

```
C = A .* B;
```

If we have two matrix (A, B) and we want to do standard matrix multiplication, we need to do the following. (Now, the sizes of A, B may not be the same, we just need to make sure A is $m \times n$ and B is $n \times l$).

```
C = A*B;
```

3 Math operations

3.1 Introduce SVD (preparation of camera calibration)

Example, we have a matrix X which size is $m \times n$, we want to do singular value decomposition.

```
[U,S,V] = svd(X);
```

Link:

More information about this function in MATLAB website
SVD in wikipedia