2021-2020 学年度期末考试

2019 级计算机视觉期末考试

（半开卷考试，提前做完就抄下来了）

班级_____姓名_____学号_____成绩_____

一、True(T) or False(F) (20 points)

1.Computer vision mainly includes perception and cognition.

2.Digital image can be regard as one dimensional matrix.

3.Image filtering only has neighborhood operation.

4.Convolution in spatial domain is equal to the multiplication in frequency domain.

5.The goal of edge detection is to identify sudden changes (discontinuities) in an image.

6.DOG-DOG(SIFT) and Harris Laplacian are scale invariant detectors.

7.The type of light-sensitive receptors only has cones.

8.Our visual system has a small dynamic range.

9.Optical flow is the apparent motion of brightness patterns in the image.

10.Optical flow cannot help track features.

二、Fill in the blank (20 points)

1.The basic element of digital image is _____.

2.Typical perception pipline includes input, _____ and _____.

3.There are several types of images, including binary image, _____, _____, etc.

4.A continuative signal can be perfectly reconstructed from its discrete version using linear interpolation, if sampling occurred with frequency_____.

5.The reason on the importance of the edge is that it can be for _____, _____, and recovery geometry and viewpoint.

6.The panorama stitching mainly has four steps, including _____, _____, match features and align image.

三、Short answer questions (30 points)

1.Please compare the difference between filtering and convolution for 2D discrete signal.

2.Please describe the Laplacian Pyramid process.

3.Given function f(x,y), please write down the functions of gradient vector, gradient magnitude and gradient director.

4.Please describe sobel operator in one dimensional filter for horizontal and vertical direction.

5.Please describe the difference between HoG and SIFT.

6.What are the means of precision and recall for object detection and how to calculate them.

四、Algorithm (30 points)

1.Please write down the formulation of Harris detector, and explain the relationship of eigenvalue in corner/edge/flat region.

2.Please describe the method of visual of words for car recognition in detail.

3.Please list two clustering method at least and describe them in detail.

五、Bonus (5 points)

给出这门课的建议。