TRINITY COLLEGE DUBLIN
SCHOOL OF COMPUTER SCIENCE AND STATISTICS
DUBLIN 2, IRELAND

QUIZ - II (November 13, 2024)
CS7GV1: Computer Vision

Time: 30 Minutes
Max. Marks: 24

NOTE: Each MCQ (Q1-Q8 and Q11-Q12) carries +2 marks for correct answer and -0.5 for wrong answer.

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1. In Harris corner detection, the Eigen values of matrix $\sum\begin{bmatrix} I_x^2 & I_xI_y \\ I_xI_y & I_y^2 \end{bmatrix}$ are λ_1 and λ_2. What is the relationship between λ_1 and λ_2 for edge detection. D

   (A) $\lambda_1 = \lambda_2 \approx 0$
   (B) $\lambda_1 >> \lambda_2$
   (C) $\lambda_1 << \lambda_2$
   (D) both (B) and (C)

2. Harris corner detection is _____. C
   (A) Scale invariant
   (B) Rotation variant
   (C) Intensity shifting invariant
   (D) both (B) and (C)

3. In SIFT, the difference of gaussian (DoG) is the approximated _____ of spatial information. B
   (A) first-order derivative
   (B) second-order derivative
   (C) 3rd order derivative
   (D) both (B) and (C)

4. The SIFT algorithm is _____. B
   (A) Scale variant
   (B) Rotation invariant
   (C) Intensity shifting variant
   (D) both (B) and (C)

5. The speed-up robust features (SURF) algorithm is developed based on _____. C
   (A) Taylor series
   (B) Laplacian operator
   (C) Integral image
   (D) both (B) and (C)

6. In 3D camera coordinate system, the optical or principal axis is _____ to the image plane. B
   (A) parallel
   (B) orthogonal
   (C) 30 degrees
   (D) 60 degrees

7. In stereo depth estimation, the pixel in left camera is (20,30). Find the same pixel location in right camera. B
   (A) (20,50)
   (B) (20,20)
   (C) (10,20)
   (D) (30,30)

8. Parallel lines in the 3D space converge at _____. C
   (A) Vanishing point
   (B) Vanishing line
   (C) both (A) and (B)
   (D) None of the above

9. Write the formula of stereo depth estimation in terms of disparity. (2 Marks)

$z = \frac{f * b}{d}$ — focus. b — baseline, d — disparity $= |x_2 - x_1|$

10. Please refer to Figure 1 and make and mark an estimate of the height at which this photo was taken. (2 Marks)

Figure 1

11. The neural network (NN) is _____.
(A) Rotation Invariant (B) Scale Invariant
(C) Translational Invariant (D) None of the above

12. Identify the linear activation layer(s) of NN in the following.
(A) Sigmoid (B) Tanh
(C) Thresholding (D) None of the above

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