EECS 442 F17 Quiz 3 9/28 Jason J. Corso, jjcorso@umich.edu

Name:

UNIQNAME#:

3	4	3	10

Directions – *The quiz is closed book/notes. You have 10 minutes to complete it; use this paper only.*

Problem 1: Recall (3 pts) (True or False)

1) One advantage of local features is low cost of computation.

2) Harris operator based on λ_- is scale invariant.

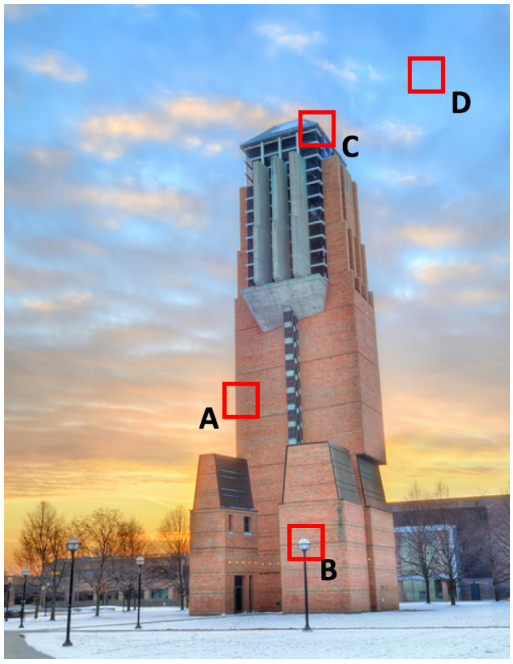
3) Eigenvalues and eigenvectors of a matrix are preserved under rotation.

Solution:

True, False, False.
Harris operator is not scale invariant; the response is closely related with the size of window. It is rotation invariant because eigenvalues are preserved under rotation.

Problem 2: Comprehension (4 pts)

Rank the four local features A, B, C, D in the image below, from best to worst.



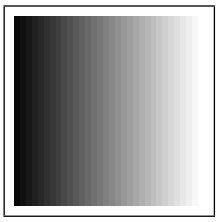
Solution:

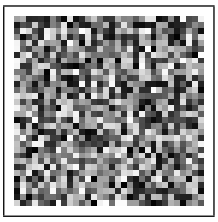
C, B, A, D

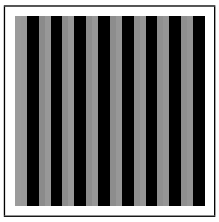
Problem 3: Comprehension (3 pts)

We discussed the meaning of the eigenvalues of the 2D structure tensor in class. Match the image with the eigenvalue relation.

(a) $\lambda_- \approx \lambda_+ \approx 0$ (b) $\lambda_- << \lambda_+$ (c) $\lambda_- \approx \lambda_+ >> 0$







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Solution:
a, c, b