

Image and Video Processing – Exam Questions

1. What is the definition of the median filter? Is this filter linear?
2. How can the median filter be extended to multiple dimensions?
3. Why is the median filter robust, while the mean filter is not? What is the breakdown point of the median filter?
4. Is the Gaussian filter separable? If yes, why?
5. What are the main steps of the running box filter? (Run filtering)
6. What are the principles of the adaptive symmetric nearest neighbors-based filtering?
7. In matching, which measure of similarity is invariant to any linear transformation of intensity?
8. What is the role of the parameter sigma in our practical approximation of the Canny filter?
9. Why do we need non-maxima suppression and what are its principles?
10. What is the Laplacian-of-Gaussian (Log) filter and how can it be used for edge detection?
11. What is the separable approximation of the Laplacian-of-Gaussian filter?
12. What are the principles of the KLT corner detector?
13. How does the KLT corner detector provide rotation-invariance to detect corners of any orientation?
14. Why and when the thresholding method based on histogram modeling by Gaussian distribution may fail to provide any result?
15. What are the advantages and limitations of edge detection and thresholding?
16. What are the principles of the Hough transform for straight lines?
17. What are the principles of the Hough transform for circles?
18. What is the basic difference between optical flow and tracking?
19. Why the optical flow equation (constraint) is valid for small displacements only? How can this problem be solved in practice?
20. What is the aperture problem? How can the problem of ambiguity be solved?
21. How the normal equation of Lucas-Kanade can be formed? What kind of information should be retrieved from the images?
22. What is the connection between Lucas-Kanade method and KLT corners?
23. List the steps of feature matching via SIFT features.