

QUESTIONS FOR FINAL ASSISMENT Introduction to Computer vision

1. Introduction to the subject.
2. The concept of computer vision.
3. Machine vision and computer vision.
4. Digital image.
5. Image formation.
6. Pinhole camera.
7. Cameras.
8. Perspective projection.
9. Affine projection.
10. Cameras with lenses.
11. Thin lenses.
12. Real lenses.
13. The human eye as an imaging device.
14. Problems of digital image formation.
15. Geometric models of cameras
16. Elements of analytical Euclidean geometry.
17. Camera characteristics and perspective projection.
18. Affine chambers.
19. Color and color image.
20. The concept of color.
21. Color images, light and color, color models.
22. The RGB color model.
23. The SMU color model. Other color models.
24. Mutually transform the color models to each other.
25. Images in the spatial and frequency domain.
26. Pixels and windows.
27. Values and basic statistics of the image.
28. Discrete Fourier transform. Inverse discrete Fourier transform.
29. Fast Fourier transform
30. Image matching.
31. The concept of image matching.
32. Image conversion models.
33. Parameter search approaches.
34. Methods of parameter estimation.
35. The task of searching and classifying similar images.
36. The concept of classification.
37. Image classification tasks.
38. Texture analysis. Local binary templates.
39. Search for similar images.
40. The main groups of features used in image recognition.
41. The tasks of determining the characteristic features of images.
42. Geometric features.
43. Topological features.
44. Statistical signs.
45. Spectral features.

46. Determination of the features characterizing the objects in the image.
47. Signs of the original image.
48. Characteristic features of point objects.
49. Signs of elongated objects.
50. Signs of closed linear objects.
51. Signs of areal objects.
52. Definition of the features characterizing the objects in the image.
53. Brightness signs are histogram signs of the image.
54. Statistical features of the image.
55. The moments of two-dimensional functions.
56. Problems of object classification.
57. Clustering, classification, and pattern recognition.
58. Geometric interpretation of the pattern recognition problem.
59. Errors of the first and second types.
60. Principles of building recognition systems: the principle of enumeration of class members, the principle of generality of properties, the principle of clustering.
61. Basic models of recognition theory.
62. Models based on the use of the separation principle.
63. Statistical models.
64. Models based on mathematical logic.
65. Models based on the principle of potential.
66. Models based on the calculation of estimates.
67. Recognition models based on threshold functions.
68. Recognition models based on the construction of threshold functions based on the principle of separation in two-dimensional space.
69. Recognition models based on the construction of threshold functions characterizing the distance between objects in two-dimensional space.
70. The construction of an extreme recognition algorithm within the framework of recognition models based on the construction of threshold functions.
71. Recognition of a person by facial image.
72. Preprocessing of facial images. Highlighting the features of facial images.
73. Determining the coordinates of the elements on the face image.
74. Recognition based on geometric features of the face.
75. Car license plate recognition.
76. Allocation of the license plate location zone.
77. Image preprocessing.
78. The Hough transform.
79. Segmentation of license plate symbols.
80. Recognition of license plate symbols.

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