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Grade	**65.00** out of 100.00

Question **1**

Correct

Mark 5.00 out of 5.00

What is true for camera calibration with a calibration pattern vs. structure from motion?

- [x] a. With a calibration pattern we can reconstruct intrinsic camera parameters. ✔
- [x] b. A calibration pattern can define the coordinate system origin in which camera poses are estimated. ✔
- [x] c. In structure from motion, camera poses (and reconstructed geometry) are not reconstructed in absolute coordinates but in a relative coordinate system. ✔
- [ ] d. Structure from motion can only reconstruct the extrinsic parameters of cameras (+ geometry).
- [ ] e. In structure from motion, camera poses (and reconstructed geometry) are not reconstructed in relative coordinates but in an absolute coordinate system.

Die Antwort ist richtig.

The correct answers are:
In structure from motion, camera poses (and reconstructed geometry) are not reconstructed in absolute coordinates but in a relative coordinate system.,

A calibration pattern can define the coordinate system origin in which camera poses are estimated.,

With a calibration pattern we can reconstruct intrinsic camera parameters.

Question **2**

Correct

Mark 5.00 out of 5.00

How are lines classically detected in an image?

- [x] a. Hough Transform
- [ ] b. K-means clustering
- [ ] c. Clustering by Graph Eigenvectors

Die Antwort ist richtig.

The correct answer is:
Hough Transform

Question **3**

Correct

Mark 5.00 out of 5.00

What's the complexity of an unoptimized iterative closest point method for N points?

- [ ] a. ln(N)
- [ ] b. N^3
- [x] c. N^2

Die Antwort ist richtig.

The correct answer is:
N^2

Question **4**

Partially correct

Mark 3.75 out of 5.00

What can enhance correspondence search?

- [x] a. Image rectification. ✔
- [ ] b. Applying epipolar constraints.
- [x] c. Using image pyramids. ✔
- [ ] d. Applying order constraints in feature appearance.
- [x] e. Normalizing correlating image patches. ✔

Die Antwort ist teilweise richtig.

You have correctly selected 3.
The correct answers are:
Normalizing correlating image patches.,

Image rectification.,

Applying epipolar constraints.,

Using image pyramids.

Question **5**

Incorrect

Mark 0.00 out of 5.00

Epipolar constraints are needed for:

- [x] a. Determining the extrinsic matrix. ✖
- [ ] b. Determining the intrinsic matrix.
- [x] c. Determining the fundamental matrix. ✔
- [ ] d. Determining the essential matrix.

Die Antwort ist falsch.

The correct answers are:
Determining the fundamental matrix.,

Determining the essential matrix.

Question **6**

Correct

Mark 5.00 out of 5.00

For solving equation systems numerically, we can use:

- a. Newton method, Gauss-Newton method, Levenberg-Marquardt method for linear equation systems.
- b. Householder algorithm, Jacobi iterations, Gauss-Seidel algorithm for non-linear equation systems.
- c. Newton method, Gauss-Newton method, Levenberg-Marquardt method for non-linear equation systems. ✔
- d. Householder algorithm, Jacobi iterations, Gauss-Seidel algorithm for linear equation systems. ✔

Die Antwort ist richtig.

The correct answers are:
Householder algorithm, Jacobi iterations, Gauss-Seidel algorithm for linear equation systems.,

Newton method, Gauss-Newton method, Levenberg-Marquardt method for non-linear equation systems.

Question **7**

Correct

Mark 5.00 out of 5.00

The layers of the following image pyramids represent results of:

- a. Laplacian pyramid: bandpass filter ✔
- b. Gaussian pyramid: lowpass filter ✔
- c. Laplacian pyramid: lowpass filter
- d. Gaussian pyramid: bandpass filter

Die Antwort ist richtig.

The correct answers are:
Laplacian pyramid: bandpass filter,

Gaussian pyramid: lowpass filter

Question **8**

Incorrect

Mark 0.00 out of 5.00

A reflectance field is a generalization of the plenoptic function.

Select one:

- True
- False ✖

The correct answer is 'True'.

Question **9**

Incorrect

Mark 0.00 out of 5.00

Noise...

- [x] a. ... can be removed by deconvolution. ✖
- [ ] b. ... is always inverse proportional to the image brightness.
- [ ] c. ... causes image gradients.

Die Antwort ist falsch.

The correct answer is:
... causes image gradients.

Question **10**

Correct

Mark 5.00 out of 5.00

High dynamic range means...

- [ ] a. ... high contrast
- [x] b. ... many tonal values ✔
- [ ] c. ... dynamic frame rate

Die Antwort ist richtig.

The correct answer is:
... many tonal values

Question **11**

Correct

Mark 5.00 out of 5.00

Which of the following convolution rules are correct (H are kernels, R is an image, k is a constant, and * is convolution):

- a. H1*(H2*R)=H2*(H1*R) ✔
- b. H1*R+H2*R=(H1+H2)*R ✔
- c. H1*(H2*R)=(H1*H2)*R ✔
- d. (kH)*R=k(H*R) ✔

Die Antwort ist richtig.

The correct answers are:
H1*R+H2*R=(H1+H2)*R,

(kH)*R=k(H*R),

H1*(H2*R)=H2*(H1*R),

H1*(H2*R)=(H1*H2)*R

Question **12**

Partially correct

Mark 2.50 out of 5.00

What is image disparity?

- a. Pixel distance on epipolar line of same scene point in un-rectified images.
- b. Pixel distance on epipolar line of same scene point in rectified images. ✔
- c. Pixel distance on x-axis of same scene point in rectified images.

Die Antwort ist teilweise richtig.

You have correctly selected 1.
The correct answers are:
Pixel distance on x-axis of same scene point in rectified images.,

Pixel distance on epipolar line of same scene point in rectified images.

Question **13**

Partially correct

Mark 2.50 out of 5.00

What are examples for image aggregation?

- a. Panorama imaging
- b. HDR imaging
- c. Multi-spectral imaging ✔
- d. Multi-focal imaging ✔

Die Antwort ist teilweise richtig.

You have correctly selected 2.
The correct answers are:
HDR imaging,

Panorama imaging,

Multi-spectral imaging,

Multi-focal imaging

Question **14**

Incorrect

Mark 0.00 out of 5.00

Transforming an image that was processed in gradient domain back to spatial domain is always possible with:

- a. Inverse Fourier Transform ✖
- b. Integration
- c. Solving Poisson's Equation in 2D

Die Antwort ist falsch.

The correct answer is:
Solving Poisson's Equation in 2D

Question **15**

Partially correct

Mark 2.50 out of 5.00

The difference between perspective, weak perspective, and orthographic projection is (f is focal length and z scene distance):

- ☐ a. Perspective projection only depends on focal length
- ☑ b. Orthographic projection only depends on focal length. ✖
- ☑ c. In weak perspective projection, f/z=const. ✔

Die Antwort ist teilweise richtig.

You have selected too many options.

If perspective projection is x'=x*f/z, then for weak perspective projection f/z = const, and for orthographic projection f/z=1.

The correct answer is:
In weak perspective projection, f/z=const.

Question **16**

Correct

Mark 5.00 out of 5.00

The fundamental matrix...

- ☑ a. ... maps points between two physical image planes. ✔
- ☐ b. ... maps points between two normalized image planes.
- ☐ c. ... maps points between a physical and a normalized image plane.

Die Antwort ist richtig.

The correct answer is:
... maps points between two physical image planes.

Question **17**

Partially correct

Mark 3.75 out of 5.00

What options for segmentation/clustering exist?

- [x] a. Semantic Labeling ✔
- [x] b. Graph Eigenvectors ✔
- [ ] c. Hough Transform
- [x] d. Graph Cutting ✔

Die Antwort ist teilweise richtig.

You have correctly selected 3.
The correct answers are:
Graph Cutting,

Graph Eigenvectors,

Hough Transform,

Semantic Labeling

Question **18**

Incorrect

Mark 0.00 out of 5.00

What is correct about radial distortion?

- [ ] a. In barrel distortion image magnification decreases with distance from the optical axis.
- [ ] b. Pincushion distortion appears in images captured with large zoom lenses.
- [x] c. In pincushion distortion image magnification decreases with distance from the optical axis. ✖
- [x] d. In barrel distortion image magnification increases with distance from the optical axis. ✖

Die Antwort ist falsch.

The correct answer is:
In barrel distortion image magnification decreases with distance from the optical axis.

Question **19**

Correct

Mark 5.00 out of 5.00

What is the diameter of a 60mm focal length f/4 lens? Your answer should be in mm.

Answer: 15 ✔

Since the *f*-Number is focal length / lens diameter, the answer is *15 mm = 60 mm / 4*.

The correct answer is: 15

Question **20**

Correct

Mark 5.00 out of 5.00

How large must the Hough-space be for detecting axis-aligned ellipses in an image?

- a. 2D
- b. 4D ✔
- c. 3D
- d. 5D

Die Antwort ist richtig.

The correct answer is:
4D

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