Detaillierte Testergebnisse für Testdurchlauf 1

1. Noise filtering [ID: 310807]

A computed tomographic (CT) image has salt and pepper noise. What filter could be applied to remove the noise prior to segmentation?

- ○ Gaussian filter
- ○ Erosion
- ○ Dilation
- ○ Opening
- ○ Closing
- ◉ Median filter

2. Segmentation algorithms [ID: 310813]

In "Assignment 1: Surgical Planning" a region growing algorithm was used to segment the vertebrae. Alternative segmentation algorithms could have been used. Which of the following methods could not be used for the segmentation of the vertebrae?

- ○ Thresholding
- ○ Deep learning
- ○ Manual delineation
- ○ Active shape models
- ◉ Singular value decomposition

3. Surgical planning [ID: 310809]

Which of the following is not considered a surgical planning activity?

- ○ Surgical Robot path definition
- ○ Resection plane optimisation
- ◉ Fiducial detection in the image
- ○ Selection of the target in the image
- ○ Anatomy segmentation
- ○ Access trajectory definition
- ○ Fiducial detection on the patient

4. Seed point selection [ID: 310819]

Which of the following methods could be used to automate the seed point selection before running the region growing algorithm on a CT image?

- ○ Select the point in the image with the lowest intensity
- ○ Manually select a bright point within the structure
- ○ Threshold the image and apply the Marching Cubes algorithm
- ○ Threshold the image, invert the voxel intensities, compute the centroid of the largest connected component
- ◉ Threshold the image, find the largest component, and compute its centroid
- ○ Apply a Sobel filter (edge detection)

5. Morphological filters [ID: 310821]

On a segmentation mask, two vertebrae are connected by one voxel. Which morphological operator could be used to separate these two regions?

- ○ Dilation
- ◉ Opening
- ○ Dilation followed by erosion
- ○ Use a binary mask
- ○ Closing

6. Surface modelling [ID: 310811]

Which algorithm could be used to create a 3D surface model from your segmentation?

- ○ Region growing
- ◉ Marching cubes
- ○ k-means clustering
- ○ Edge detection

7. Region growing [ID: 310815]

Which homogeneity criterion is used to stop the region growing algorithm implemented in "Assignment 1-Surgical Planning"?

- ○ Texture similarity
- ○ Gradient detection
- ○ Size constraints
- ○ Shape constraints
- ◉ Intensity thresholds
- ○ Confidence connected

8. Connectivity rule [ID: 310817]

In "Assignment 1: Surgical Planning", how many neighbours are visited during each iteration of the region growing algorithm?

- ◉ 26
- ○ 4
- ○ 6
- ○ 8
- ○ 18