EE-451 - Image analysis and pattern recognition – Prof. Jean-Philippe Thiran
Spring 2021
List of questions for the interviews

Part 1 – long answers

1. Present how to perform geometrical transformations of a digital image? Take the example of a translation of a non-integer number of pixels.

2. What is image restoration? On this context what is inverse filtering and what is a Wiener filter?

3. Explain what object labeling is and the algorithm to implement it.

4. What are the main principles of edge detection, and the two main families of methods to do edge detection? Present typical methods for each family.

5. What are the 4 main operators of binary mathematical morphology? Explain each of them.

6. What are the Fourier descriptors?

7. What are the Fourier descriptors?

8. What is a Freeman code?

9. What is a morphological skeleton?

10. What is a Bayesian classifier? (principle, advantages & limitations, application to Gaussian cases)

11. What is a Bayesian classifier? (principle, advantages & limitations, application to Gaussian cases)

Part 2 – short answers

1. What is a Median filter?

2. What is a Median filter?

3. What is the Laplacian of Gaussian (LoG) method for edge detection? (this question cannot be taken if question 4 is taken in Part 1)

4. How do we calculate the axes of inertia of a binary object?

5. What is an Euclidean distance classifier?

6. What is a Mahalanobis distance classifier?
7. What is a k-NN classifier?
8. What is a linear perceptron and how can we train it?
9. What is a Multi-layer perceptron?
10. What is supervised and non-supervised classification?
11. What is non-supervised classification and describe the k-means algorithm?