Syllabus of the course "Methods for Image Processing" a.y. 2018/19

December 19, 2018

This document reports a description of the topics covered in the course *Methods for Image processing* for the academic year 2018/19, in relation to those covered in the textbook:

> R.C. Gonzalez and R.E. Woods, Digital Image Processing, (3 ed.), Prentice Hall, 2008. ISBN 9780131687288.

The topics have been organized in the following categories:

- Topics that cannot be ignored: the topics belonging to this category are considered fundamental and belong to the cultural background of image processing experts; these topics should not be considered as a subject of choice, if during the oral exam the student is asked to pick a subject.
- Topics to be studied well: the topics belonging to this category are those that have been studied during the course and will be considered for the exams.
- Topics that it would not hurt to know: topics not covered during the course for lack of time, but that can be interesting.

Topics that cannot be ignored

These topics are given for granted and are marked in *cyan* in the Table of contents reported at the end of the present document. They are:

- Chapter 1 - Introduction
- Section 2.4 - Image Sampling and Quantization (excluding 2.4.4, not covered during the lessons)
- Section 2.6 - An Introduction to the Mathematical Tools Used in Digital Image Processing
- Sections 4.1 e 4.2 - Background e Preliminary concepts in Filtering in the Frequency Domain

Topics to be studied well

The topics covered during the lessons are marked in *red* in the Table of contents reported at the end of the present document. They are:

- Chapter 2 - Digital Image Fundamentals (excluding 2.4.4)
- Chapter 3 - Intensity Transformations and Spatial Filtering
- Chapter 4 - Filtering in the Frequency Domain (excluding 4.10 and 4.11)
- Chapter 6 - Color Image Processing (excluding 6.8 and 6.9)

- Chapter 8 - Image Compression (excluding 8.2.6, 8.2.7, 8.2.9, 8.2.10, and 8.3)
- Chapter 9 - Morphological Image Processing
- Chapter 10 - Image Segmentation (excluding 10.3.6, 10.3.8, and 10.6)

Topics that it would not hurt to know

Topics not covered during the lessons, but that worth at least a reading, are marked in *yellow* in the Table of contents reported at the end of the present document. They are:

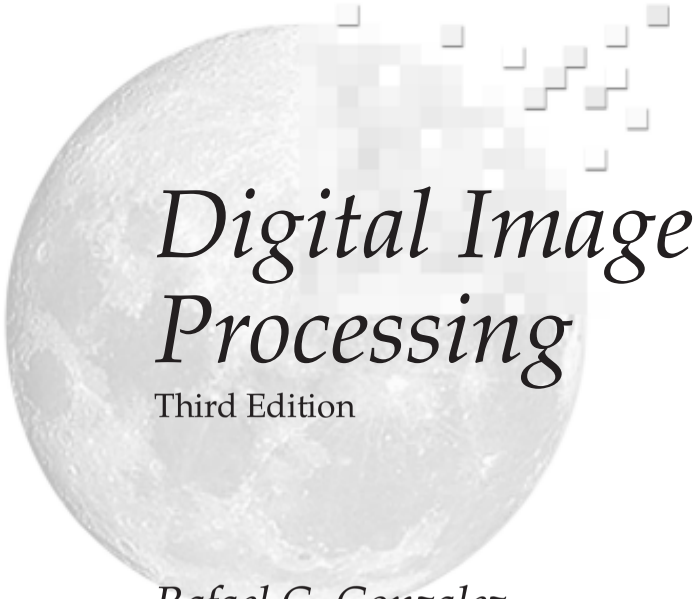
- Section 2.4.4 - Image Interpolation
- Section 4.10 - Selective Filtering
- Section 4.11 - Implementation (of FFT)
- Chapter 5 - Image Restoration and Reconstruction
- Section 6.8 - Noise in Color Images
- Section 6.9 - Color Image Compression
- Chapter 7 - Wavelets and Multiresolution Processing
- Section 8.2.6 - Symbol-Based Coding
- Section 8.2.7 - Bit-Plane Coding
- Section 8.2.9 - Predictive Coding
- Section 8.2.10 - Wavelet Coding
- Section 8.3 - Digital Image Watermarking
- Section 10.3.6 - Multiple Thresholds (in Image Segmentation)
- Section 10.3.8 - Multivariable Thresholding (in Image Segmentation)
- Section 10.6 - The Use of Motion in Segmentation

Table of contents of the textbook

In the following, the Table of contents of the textbook (R.C. Gonzalez and R.E. Woods, Digital Image Processing, 3 ed., Prentice Hall, 2008. ISBN 9780131687288) is reported with the Chapters and Sections marked using different colors for the categories the topics belong to:

- cyan : topics that cannot be ignored;
- red : topics to be studied well;
- yellow : topics that it would not hurt to know.

For any clarification please contact the teacher.



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