Digital Image Processing 2019 20 - Homework 1

Instructor: José Delpiano - Teaching Assistant(s): To be defined

August 2019

1. Main goal

Study and apply the concepts of correlation and convolution.

2. Tasks and Questions

1. Install and setup the software solution or programming language you think you will be using this term.
2. Find and download three images from the *Where's Wally?* book series. (Tip: On `https://images.google.com`, go to Tools/Size/Large.) Prepare a few artificial images with several instances of a given character placed by yourself on known positions over a cluttered background.
3. Study the relation of formulas of 2D cross-correlation and convolution. What are the differences and similarities?
4. Experiment with cross-correlation (hint: it may be easier to find an implementation of 2D convolution) and normalized cross-correlation. Use the images you found and the artificial images you prepared.
5. Propose a solution for finding Wally in a general image.
6. Implement you solution. Use Matlab or Python (ask the instructor if you would like to use another language). Your code should run on a computer with a standard configuration (the one of the person grading your work). In your report, please indicate clearly how to run your code.
7. Evaluate the results given by your solution, using measures like *intersection over union*.

3. Submission

Submit before 8pm, 21 August, via SAF. Use pdf format, with no more than eight pages, in English, font size 12. Submit clearly commented code in English.