
Scene Segmentation and Interpretation

Image Characterization

Introduction

Texture is an important image feature used in many computer vision systems. In this coursework, we will analyse and implement different statistical methods in order to extract image texture descriptors. In particular, we will focus on the Co-occurrence matrices and the Energy filters (Laws filters). They are well-known texture descriptors, fast and easy to implement and provide good results that could be used in a posterior step to perform image segmentation and object recognition.

In this coursework the main goal is to be able to create output images corresponding to different texture descriptors. Therefore, we will apply both the co-occurrence matrices and energy filters at local level producing descriptors for each pixel.

Matlab guidelines:

- `filter2`, `conv`, `fspecial` (compute mean, abs mean, and std descriptors for Laws filters)
- `graycomatrix`, `graycoprops` (compute Contrast, Energy, Homogeneity and Entropy descriptors)

Objectives

- A)** Information search.
- B)** To understand the texture descriptors. To design, analyse and implement the algorithms in matlab.
- C)** To test the algorithm with several images. To study the problems and possible improvements.
- D)** Documentation.

Coursework: (4 hours)

- A)** Coursework documentation with the following sections:
 - 1) Introduction and problem definition.
 - 2) Algorithm analysis.
 - 3) Design and implementation of the proposed solution.
 - 4) Experimental section and results analysis (speed, quality, etc).
 - 5) Organization and development of the coursework (tasks, time estimations and real dedication).
 - 6) Conclusions.
- B)** Matlab code with comments.

Coursework Evaluation:

We provide an algorithm analysis and design to validate your approach. We also provide guidelines for solving the coursework and some image results.