Efficient Color Textons

The basic idea of textons is to represent images (in particular their texture) as a mixture of texture elements (called textons). One possibility to define these elements is to apply a set filters to the image and to cluster the resulting filter responses. The description of a given image region is then computed by counting the relative occurrence of these elements. This texton histogram can be used in manifold applications such as image retrieval, image labelling, and texture classification.

While first texton implementations work on grey-scale images only, there are recent extensions to color images as well. These have been shown to lead to superior results at the cost of a significant larger computational load.

The goal of this thesis is to redesign color textons to achieve a significant decrease of computation time while maintaining robustness and accuracy. This can be achieved by changes in methodology (i.e. suitable approximations) as well as efficient implementations (e.g. parallel computing).

Keywords: Texture descriptors, textons, clustering

Involved tasks:
– Literature research
– Getting acquainted with the existing framework
– Extending and improving the existing framework

(Recommended) requirements:
– Good knowledge about digital image processing (e.g. attendance in lecture DIP)
– Good programming skills (e.g. C++)

Language: German / English