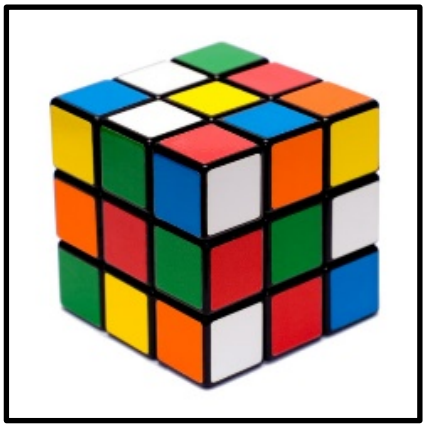
Bauhaus-Universität Weimar



Assignment 5

Topics:

- Image segmentation using *k-means* clustering
- Clustering using *mean shift* or *normalized cut*

A) Simple *k-means* clustering

a. Read the exemplary color input image `inputEx6.jpg` (see above) and setup a three dimensional RGB feature space

b. Implement an own simple *k-means* clustering approach with random initialization (see lecture notes) to group the color features

c. Select an appropriate number of clusters *k*, apply the algorithm and visualize the detected groups in feature and image space (e.g. with color coded)

B) Advanced clustering using *mean shift* or *normalized cut*

a. Select a more advanced clustering method and implement only one of them (see lecture notes)

b. Find appropriate parameters (e.g. window size, similarity threshold), apply the algorithm to the example image `inputEx6.jpg` and visualize the detected groups in feature and image space

c. Extend the three-dimensional feature space with additional spatial support using the pixel positions (*x, y*) and test your algorithms from task A and B on the five-dimensional feature space. Are the results different or significantly better?

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