

5. Theoretical Questions

Please answer each question as precisely and accurately as possible (2-3 sentences)!

a. Why would another object with the same color not be part of the foreground? And what would happen if this other object would be very close to the foreground we are looking for?

In the Interactive Image/Video segmentation pipeline regions which are far away from the foreground object and have the same color get removed. Therefore foreground regions that are not spatially or temporally connected to the foreground scribbles defined by the user are removed. If this object is very close it depends on the block size of the filter kernel if it is defined as foreground or not.

b. Why is it important to take a “good” reference frame for the scribbles, which contains as many different colors of the foreground object as possible?

In the reference frame the user defines scribbles which mark the foreground, and out of this a foreground color model is created. Then this color model is used to compute the cost volume for each pixel which indicates if it belongs to the foreground or not. If the reference frame doesn't contain as much different colors of the foreground as possible, the whole image segmentation gets worse because the foreground color model doesn't contain colors which actually are in the foreground and therefore pixels with this colors will not be assigned to the foreground.

c. What are meaningful parameters for the function “guidedfilter_vid_color” and what are they standing for?

The meaningful parameters are:

I_vid - a sequence of RGB-frames which are used as guidance

P_vid - a sequence of grayscale-frames which get smoothed with the filter

r - spatial window radii of the filter (x- and y-axes)

rt - temporal window radii of filter (time-axe) for the box filter

eps - regulation parameter, great eps = great smoothness