

CENG 391 Introduction to Image Understanding

20 October, 2017

Homework 1

Due Date: 02 November 2017, 23:55

Programming Assignment — Region Of Interest(ROI) Selection Tool

In this assignment, you are expected to design and implement a ROI selection tool. This tool should allow users to have three important capabilities:

1. **Select a ROI on the image:** Region should be selected by double-left clicking on two points (which indicate top-left(the first click) and bottom-right(the second click) corners of the desired region). This operation should satisfy following subtasks:
 - Draw a green dot for both points.
 - Draw a yellow circle with 10 pixel radius for both points to show the editing area of points.
 - Draw a red rectangle for the ROI.
 - Selected points should be far away from each other at least 10 pixels.
 - Example for the desired output of this process is given in the Figure 1.



Figure 1: Example for the ROI selection operation.

2. **Edit selected ROI:** Selected region should be changed by editing either of the two pre-selected points. This operation should satisfy following subtasks:
- Only a single point should be edited at a time.
 - When user picks a green dot by clicking anywhere within the editing area of it, the color of the point should be changed to magenta to show that state of this point is standby and its location will be changed.
 - Remove the magenta dot and the yellow circle of the standby point.
 - Draw a green dot on newly picked point.
 - Draw a yellow circle with 10 pixel radius on newly picked point.
 - Draw a red rectangle for the new ROI.
 - Edit operations should be valid based on points' coordinates which is explained with an example in Figure 2.

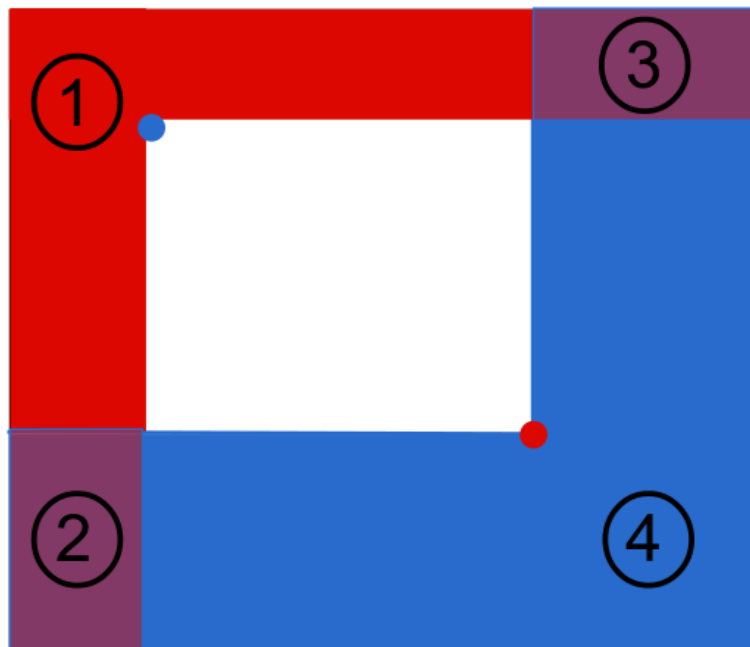


Figure 2: Non-clickable areas for the selected points. For the blue point(top-left corner), your application should prevent the new point selection on area2, area3, and area4. For the red point(bottom-right corner), your application should prevent the new point selection on area1, area2, and area3.

3. **Save ROI to the file:** After selection and editing operations, by asking the name of the object located in the ROI to the user, the ROI should be saved to the file named as "**roi_file.txt**" in the following format:
"object_name, top_left_coords, right_bottom_coords"
 e.g. "car, (325,345), (520,165)"