About This Experiment

The goal of this experiment is to assemble a database to benchmark image segmentation methods on large images. You are asked to indicate all the edges and boundaries that you can identify in a few images. Some images contain multiple Regions of Interest (ROIs), in that case you are asked to indicate the boundaries of all ROIs. To mark the boundaries in the image, you must use the Labeling Tool to draw boundaries of all elements that you identify in the image. Once you have labeled all the images, just zip the folder "GT" and sent it to me by email.

As this is a subjective task, there are many possible labeling for a single image, as shown in the examples bellow. There is no "correct" or "wrong" labeling. We wish you to decide what is relevant or not in each image. The information you provide will be used to train and evaluate image segmentation methods.

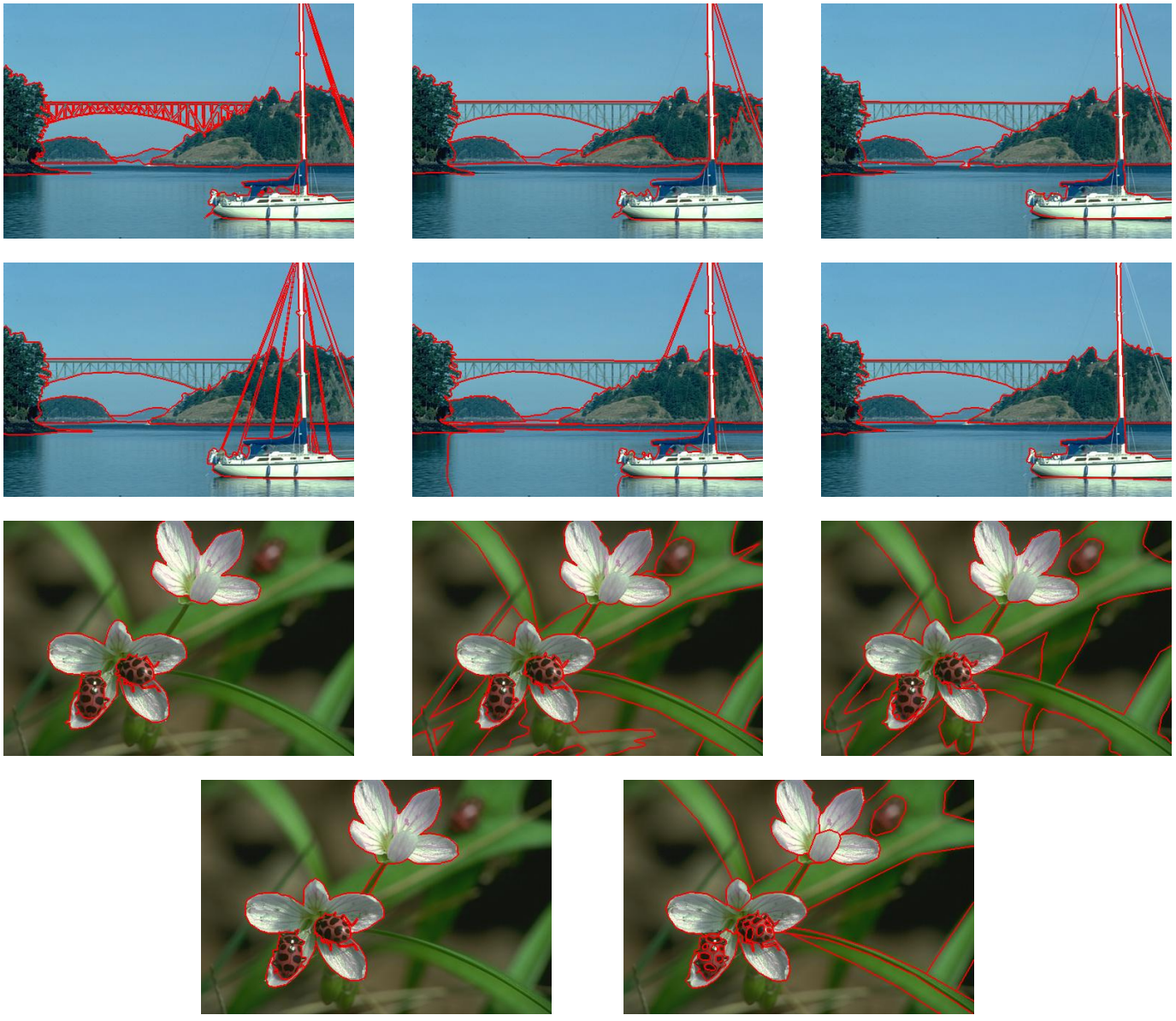


Figure 0.1: Examples of different boundary markings for the same image.

Quick Instructions

1. on MATLAB, navigate to the folder "Labeling Tool"
2. run 'startLabeling.m'
3. define a contour by drawing a polygon (click to create vertices).
4. make adjustments to the polygon (drag and drop the vertices).
5. double-click inside the polygon to record that contour
6. choose the next operation on the menu in the left window:
   a) New contour: Repeat the steps 2 to 5 (previous ones will appear as red lines in the image)
   b) Finish labeling: Save all contours and go to next image.
   c) Edit Contour 'X': Edit a previously inputed contour.
7. once all images have been labeled, email me the files in the folder "GT".

Red lines will indicate the boundaries already drawn in the image. To stop this software just close it's windows. You can resume it later repeating the steps above.

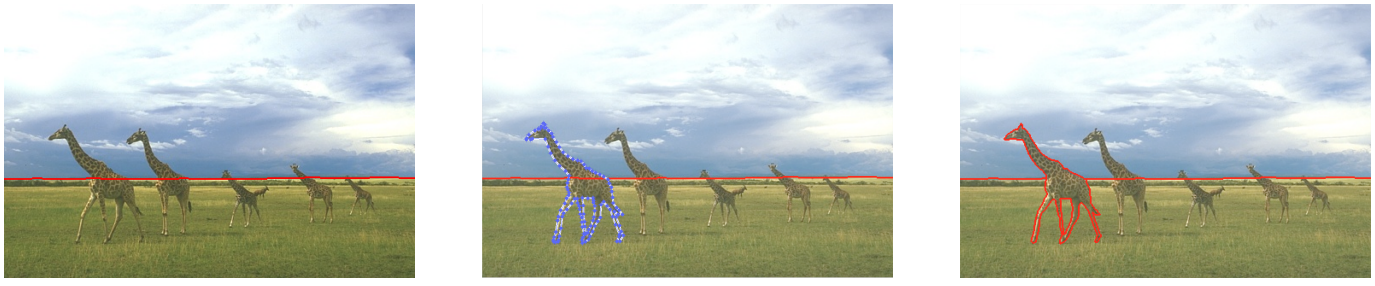
Guidelines to define boundaries

The goal here is to provide handmade segmentation for image that will be used to benchmark image segmentation methods. The image segments must indicate the boundaries of all the elements present in the image. Using the Labeling Tool provided to you (in the folder "Labeling Tool") you must indicate the location of these boundaries by drawing closed polygons over the image.

To draw a new polygon, select "New Contour" the the action menu and then click on the desired vertex locations. Click on the first vertex to close that shape. Be as accurate as possible when assigning the vertices. You may use as many vertices as needed, and take as long as you wish to label the image. We are not interested in the time it takes.

After the polygon has been closed, each vertex positions can be adjusted individually dragging it to the desired locations (the cursor will change to a circle when pointing to a vertex). To add a vertex to a closed polygon hold "a" and click in an edge. To remove a vertex of a closed polygon right click on the vertex and select "delete vertex". Selecting "Finish labeling" in the side menu saves the boundaries in the current image and

If an element is located near the image limits (the "end" of the image) you must draw the polygon close to that point. After the polygon is closed, you can drag vertices outside the image to define that shape As we are interested in the boundaries between image elements, when two polygons overleap the latest one will placed on top of the other, thus ignoring any boundaries inside its area, as shown below:



(a) Older contour (b) New contour is drawn (c) New contour overwrites the old

Figure 0.2: Examples of overleaping boundaries: the new contour overleap the older one.

It is not necessary to label all the image at once. You can stop at any point, by closing the software, and resume the labeling later. Just run it again and the contours you put before will be loaded. The images will appear in the same order, but you can select "Finish Labeling" to proceed to the next image.

Contour Drawing Software

To start this software open MATLAB, navigate to the folder "Labeling Tool" and run 'startLabeling.m' This software has 3 windows:

- **Main window**: The large window on the right side will show de image. This is where the boundaries should be drawn.
- **Zoom Window**: The top left window has buttons to zoom in/out and an overview of the image. The zoom buttons are on the toolbar of that window. Default zoom is 100%, so the image may not be entire visible depending on your monitor resolution.
- **Action Window**: The bottom left window contains a popup menu for selecting the next action after a contour is inputed. This menu is not visible while inserting or editing contours. The options are:
    1. *New contour*: mark an element's boundary in the image.
    2. *Finish labeling*: Save all contours and go to next image.
    3. *Edit Contour 'X'*: Edit a previously inputed contour.

You can stop labeling and resume at any time you want.

To stop this software just close it's windows. To resume labeling the images, run 'startLabeling.m' again. The images will be shown in the same order, along with the contours entered for it. You can just chose "Finish labeling" to go to the next image.