Object Detection Warm-up

In this exercise you will write a program to find an object of interest in an image. Your program should receive a set of two or more images of the same scene with different viewing angles and scales. For example:

Your program should open image $I_1$ and prompt the user to select a region of interest $R$ using the mouse. It will then find and mark the region that is most similar to $R$ in each of the images $I_2, \ldots, I_n$.

As metric of similarity use:

1. The pixel-to-pixel difference in the regions.

2. The difference of the histograms of gradients of the regions. To obtain better results, you may want to partition the regions into subregions and use the concatenated histograms of the subregions as features.

3. Extra credit: SIFT descriptors, as explained in the textbook.

Your code should work at different scales. As we have discussed, this is attained by upscaling and downscaling images $I_2, \ldots, I_n$, while keeping $R$ constant.
Use the image set provided in the class webpage and at least another image set generated by you. For each image set, try several objects of interest and try to determine which types of objects are better suited for search using each feature set. As usual, write a report describing your results.