

# Homework

- 1) Download package sie\_three: [http://ias.cs.tum.edu/~pangerci/sie\\_three.tar](http://ias.cs.tum.edu/~pangerci/sie_three.tar)
- 2) Write a node converter.cpp that loads the image scene.png from disk, converts it into the grayscale image, resizes it for 50%, draws one rectangle and one circle into it and saves it back to disk under the name scene\_grayscale.png.
- 3) Familiarize yourself with the code in the node src/openCV\_to\_ros.cpp and learn how to load the scene.png image and publish it on a topic.
- 4) Write a node find\_color.cpp that pulls the image (scene.png) from the topic openCV\_to\_ros.cpp publishes to, and finds the red object on the table. Draw a rectangle around the object in the original image and save the image under the name scene\_red\_object.png. Hint: see the example code in src/blob\_detection\_hsv.cpp or check out the cmvision library in ROS: <http://www.ros.org/doc/api/cmvision/html/>
- 5) Write a node find\_edges.cpp that pulls the image (scene.png) from the topic openCV\_to\_ros.cpp publishes to, and finds all the edges in it. Hint: see the code in vision\_opencv/opencv2/build/opencv-svn/samples/c/edge.c. Save the image with edges under the name scene\_edges.png
- 6) Bonus: SURF (alternative to SIFT) descriptor. Study the code in vision\_opencv/opencv2/build/opencv-svn/samples/c/find\_obj.cpp. Take 2 images of one object in your household from different viewpoints and carry out matching on them. Save results under the name my\_object\_surf.png.
- 7) Send all the code and images to [blodow@cs.tum.edu](mailto:blodow@cs.tum.edu) by 20.5.2010.