Objective:

Write your own code to implement Generalized Hough Transform (GHT) to detect some simple objects in test images.

Assignment:

There are two sets of test and template images. You are asked to find the "elephant" and "bear" from both test images "animals" and "animals2". Optionally, you may do additional tests by finding all letters 'K' and 'Q' in the test image "letters".

The main steps are: (a) Edge detection, (b) GHT model (R-table) generation from the template images, and (c) Object detection from the test images, possibly with various scales and rotations.

- Use any of your favorite methods for smoothing, edge detection and thinning.
- Use block.tif to debug your program first, i.e., use it for both Model Generation and Object Detection.
- You do not need to try all possible scales and rotations. Based on your observation of the test images, choose some estimated scales, e.g., 1.4, 1.5, 1.6, and orientations, e.g., 10°, 15°, 20°.
- To demonstrate the correctness of your object detection, please use circles (or squares) to indicate the locations of the detected objects in the test images.
- Optionally, you may include some more advanced methods for peak identification and improvement.

What to hand in:

1. Submit on line your program source code and a Report with your results, e.g., the edge maps, graphical display of the accumulator arrays, the images with the marked detected objects, etc.
   To show the accumulator arrays more clearly, please also print out some portions of them that contain peaks in numeric form (arrays of numbers).
2. A demo of your results.

Related files

- Test images: PA2-testimages.rar