SORDE(Software for Object Recognition and Distance Estimation)

This project aims to use OpenCV for recognizing, tracking, and estimating distances to objects for future development of marker-less augmented reality applications or as an aid for visually impaired individuals. SORDE(Software for object recognition and distance estimation) is written in C++ and makes use of OpenCV and Qt.

Object categorization:

- Compute SURF descriptors and keypoints in all template images
- Compute training data for the SVM classifiers
- Train a one-vs.-all SVM for each category of object using the training data
- Classify by using the trained SVMs

Distance estimation:

- Get depth from disparity - reprojectImageTo3d() does this by taking the disparity and the disparity-to-depth mapping matrix Q generated by stereoRectify()

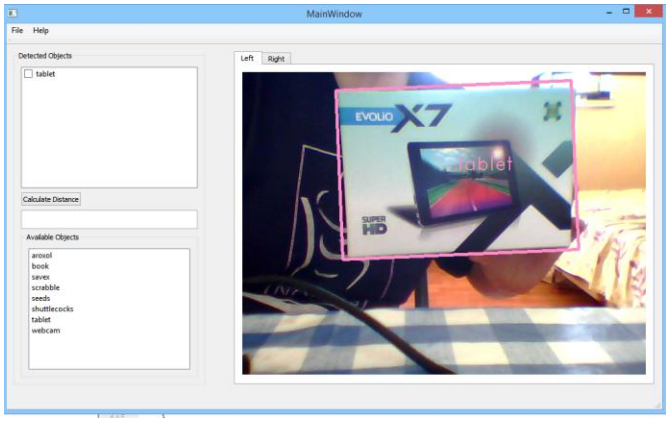
File →Load Dictionary: Load BOW vocabulary from file

File → Generate template keypoints: Generates SURF keypoints and descriptors for object categories template images

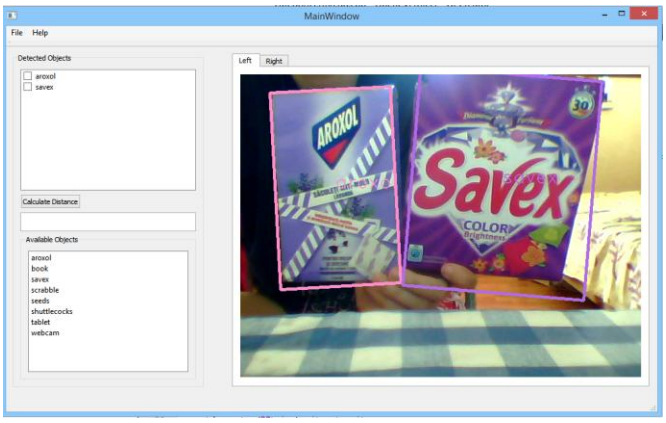
File →Add object: add new category to BOW vocabulary and train SVM to recognize that category, the dialog can be used to capture the template image and the training images

File →Camera Calibration: Calibrates the left and right cameras individually, stereo calibration and stereo rectification

TIP: Make sure to disable your laptop's built-in webcam, especially if you are using a stereo camera built from two individual USB webcams

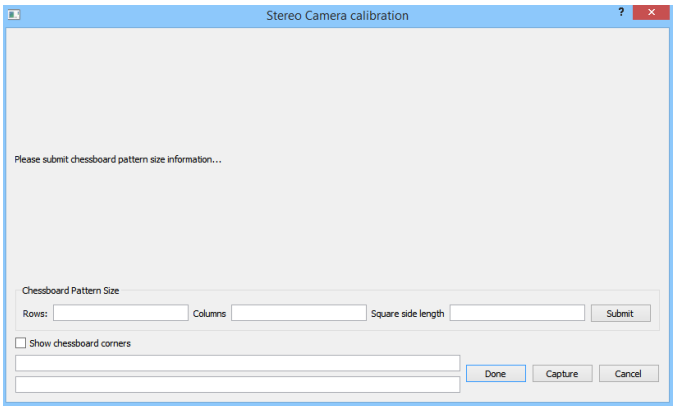


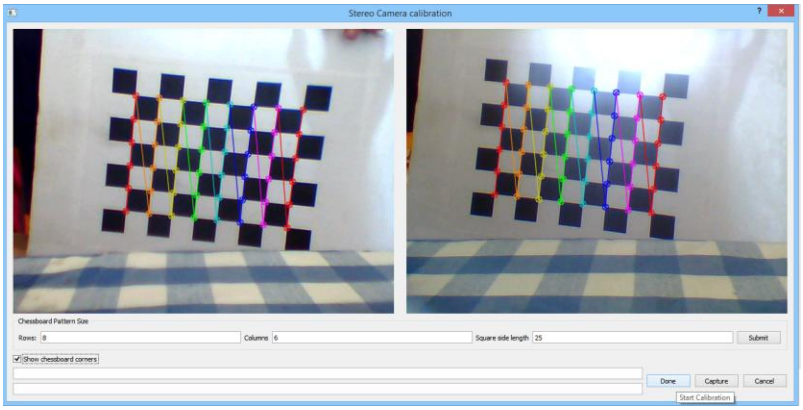
Recognizing an object



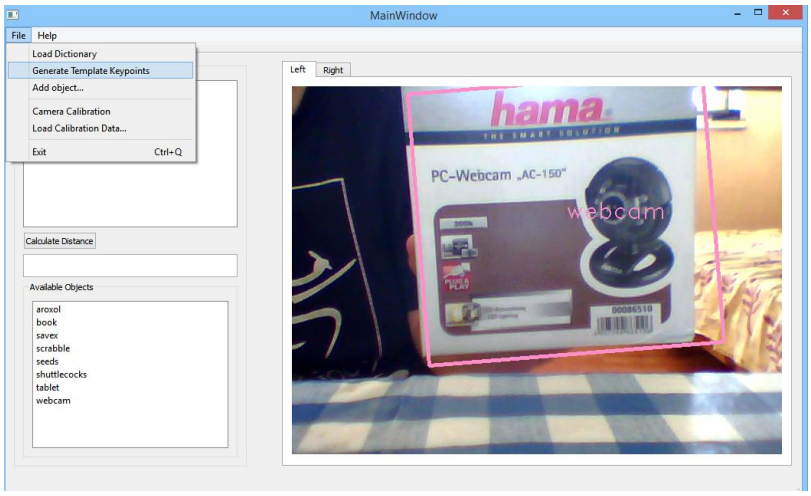
Recognizing multiple items

Training the SVM to recognize a new type of object/category





Dialog for capturing images to be used in camera calibration



File menu