Bogazici University, Electric Electronic Eng.,
H. Işıl Bozma
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EE 576 - Hw 4

Q1 The goal of this project is to make you work with object representation, learning and recognition. Consider the Washington RGB-D dataset. (`https://rgbd-dataset.cs.washington.edu/dataset/`). For each object, leave aside one set out of N sets provided for testing.

1.a First choose 5 objects that are in the dataset. Obtain BOW representation of these objects using color (RGB) data. For BOW representation, pls use the OpenCV API.

1.b Use OpenCV SVM API to learn each object - considering the BOW descriptors of the learning samples provided. Use one-class SVM for each class.

1.c Now use the learned models to recognize these objects on the test set images. Consider three different τ threshold values. What is the recall and precision rates for each class and for each τ pair. Draw ROC curve (recall vs precision for the three τ values) for each class. Which class model has the best performance and which class has the worst performance and provide your insight regarding this.

1.d Repeat steps a,b,c using only depth (D) data (Point cloud) . Here, you may use either BOW representation as obtained from depth data or any other representation that you prefer.

1.e Compare performance of RGB vs D data for the objects you have chosen and give you insight on this comparison.

Write a very short report (1-2) in latex that discusses your algorithms for each part, sample results for parts (a)-(c). Pls provide code and your report's tex, original figure files and pdf files. If you are using Overleaf, you may provide the link instead.