Introduction:

This toy demo shows the complete process of Post Tuned Hashing (we use ITQ+Post-Tuning as the example, refer to our paper). The used data are 4,000 2-d points from 4 different Gaussian distributions. The process consists of:

Step (i) hashing: use the noted ITQ [6] to hash data to 2-bits codes.

Step (ii) post-tuning skeleton points: randomly sample 100 points as the skeleton points. Post-tuning the ITQ codes of skeleton points by using the proposed post-tuning algorithm (refer to section 3.1,3.2, objective function Eq.(7)).

Step (iii) post-tuning out-of-sample points: post-tuning the ITQ codes of the rest data (3,900 points) by using the proposed out-of-sample extension (refer to section 3.3, objective function Eq.(12)).

How to use:

Run demo.m to see the toy illustration. We suggest to run it with Matlab 2015 on Windows (we have tested our demo with Matlab 2009 and 2015 on windows).
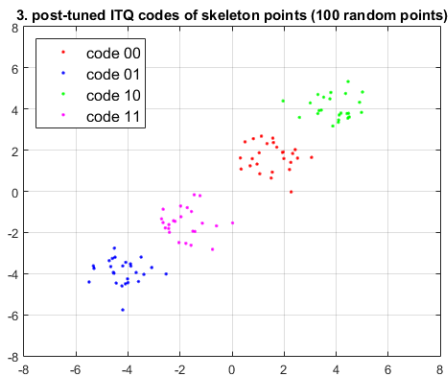
Demo results:

The demo will show how PTH maps a 4,000 points dataset to the final binary codes according to step **(i), (ii) and (iii)**. It will generate 4 Figs as follows: Fig (1) shows the data, Fig (2), (3) and (4) show the results of step **(i), (ii) and (iii)**, respectively. The color of a point denotes its code.
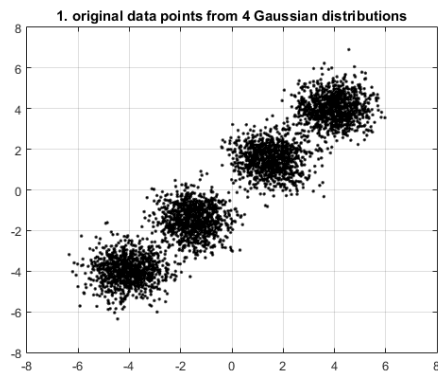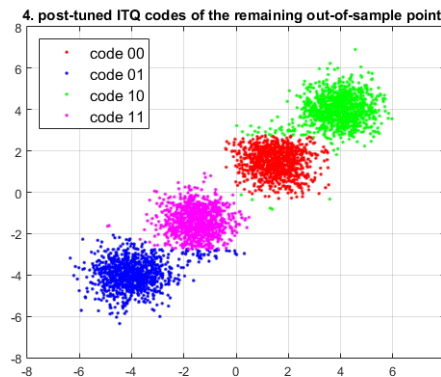

(1)

(2)

(3)

(4)

From Fig. (2) and (4), we see that our post-tuning helps ITQ to better preserve data

neighborhood structure and hence improves the indexing performance of binary codes. Note that ITQ is one of the top-performing unsupervised Hashing method. From Fig. (3) and (4), we also see the effectiveness of our out-of-sample extension in handling new data (out-of-sample).