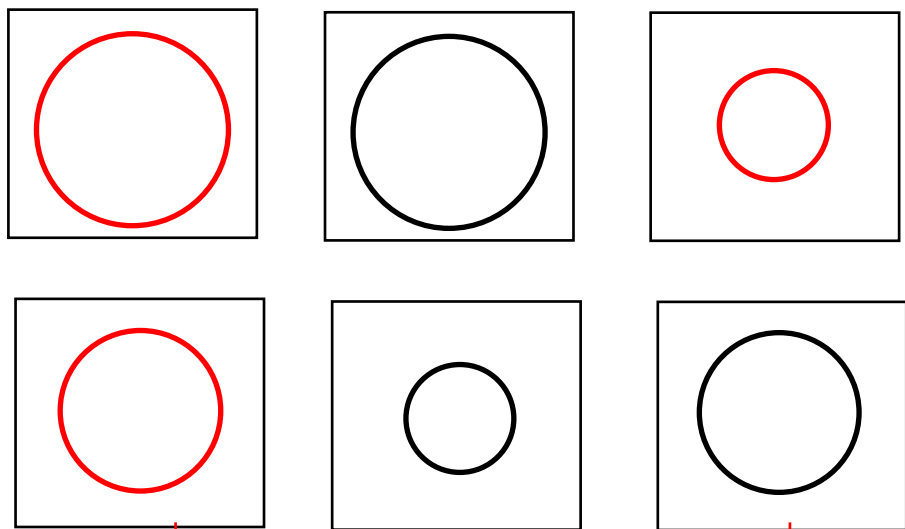


学習対象



特徴量抽出

機械学習

学習データ

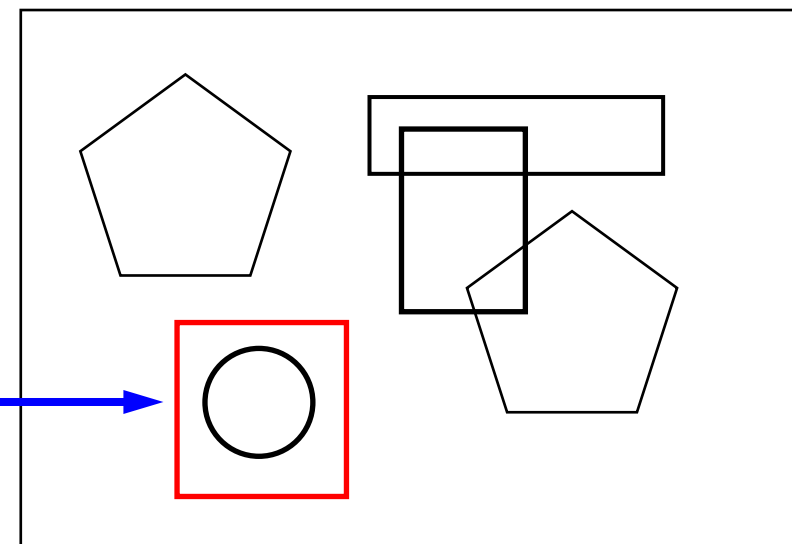
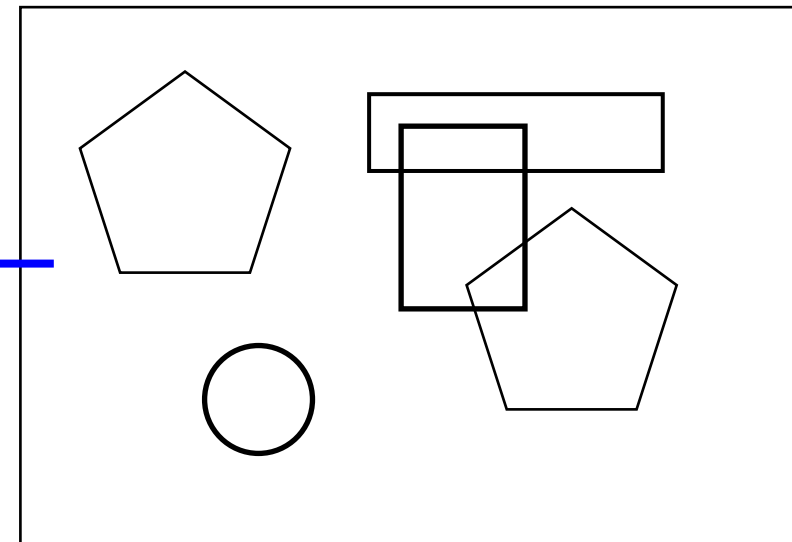
図形検出

特徴量抽出

学習データ
と照らし合
わせて判別

検出

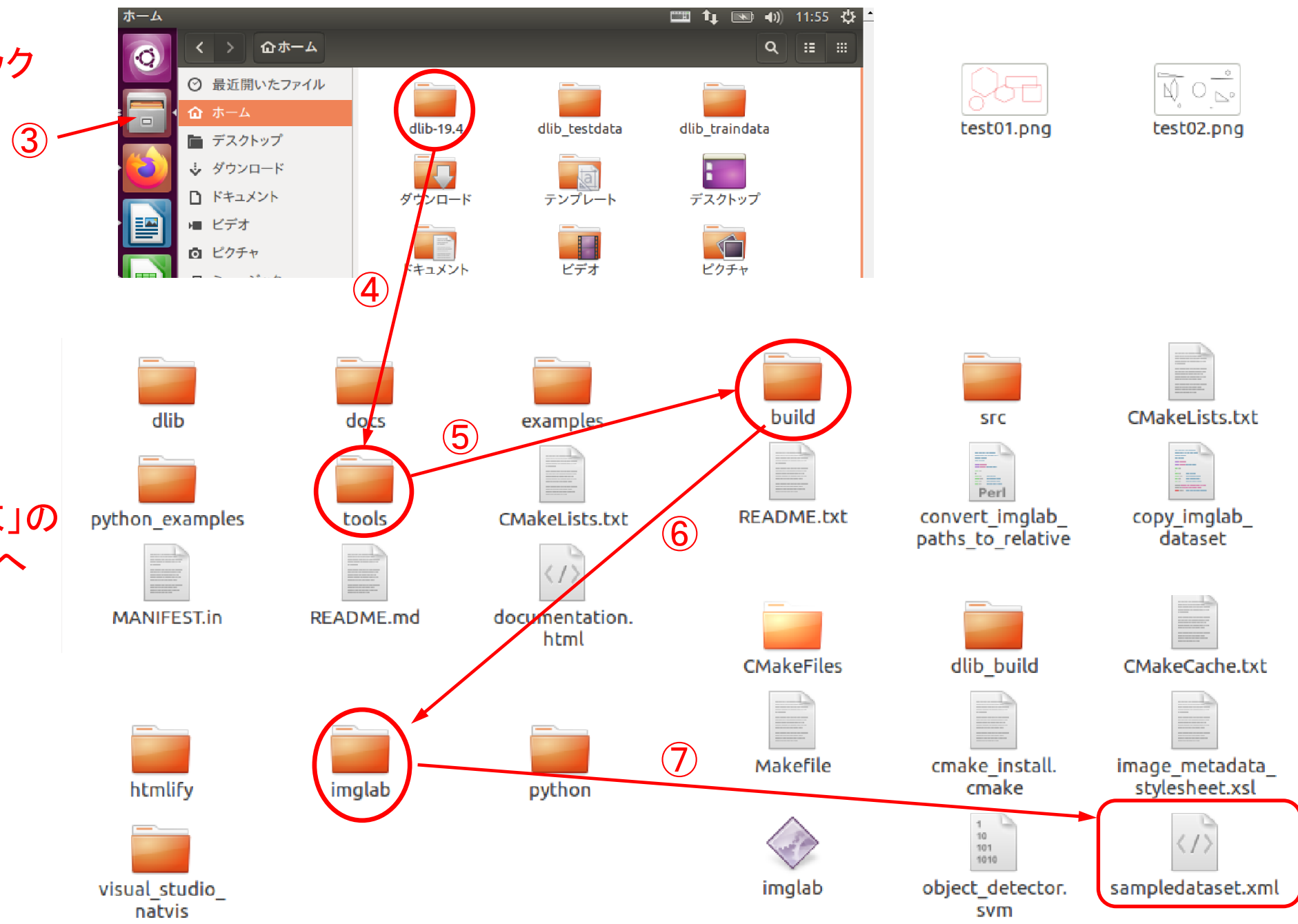
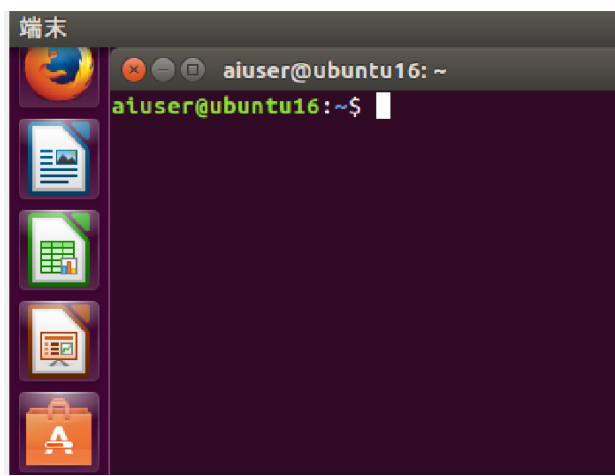
検出対象



①virtualBoxアイコン
→マネージャーで起動クリック



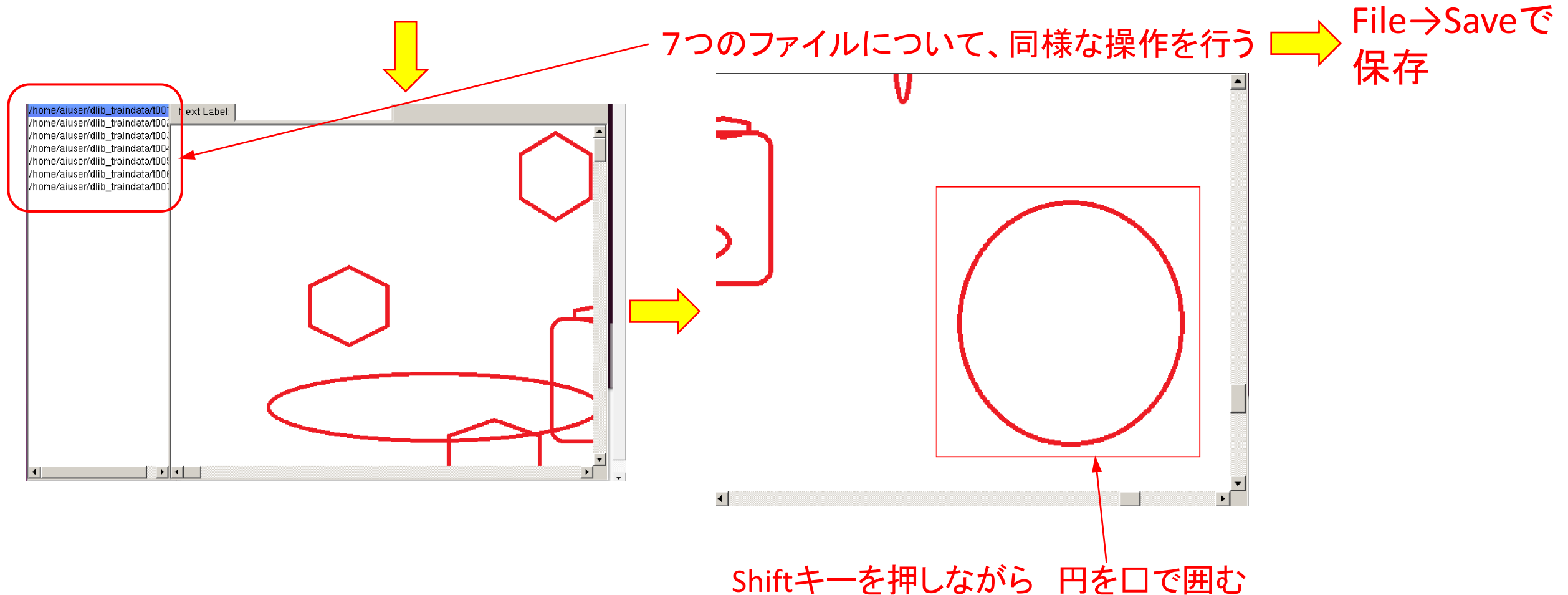
②Ctrl+Alt+Tあるいは「端末」の
アイコンをクリックしてLinuxへ



```
aiuser@ubuntu16:~$ cd ~/dlib-19.4/tools/implab/build
aiuser@ubuntu16:~/dlib-19.4/tools/implab/build$
```

学習データ 読み込み

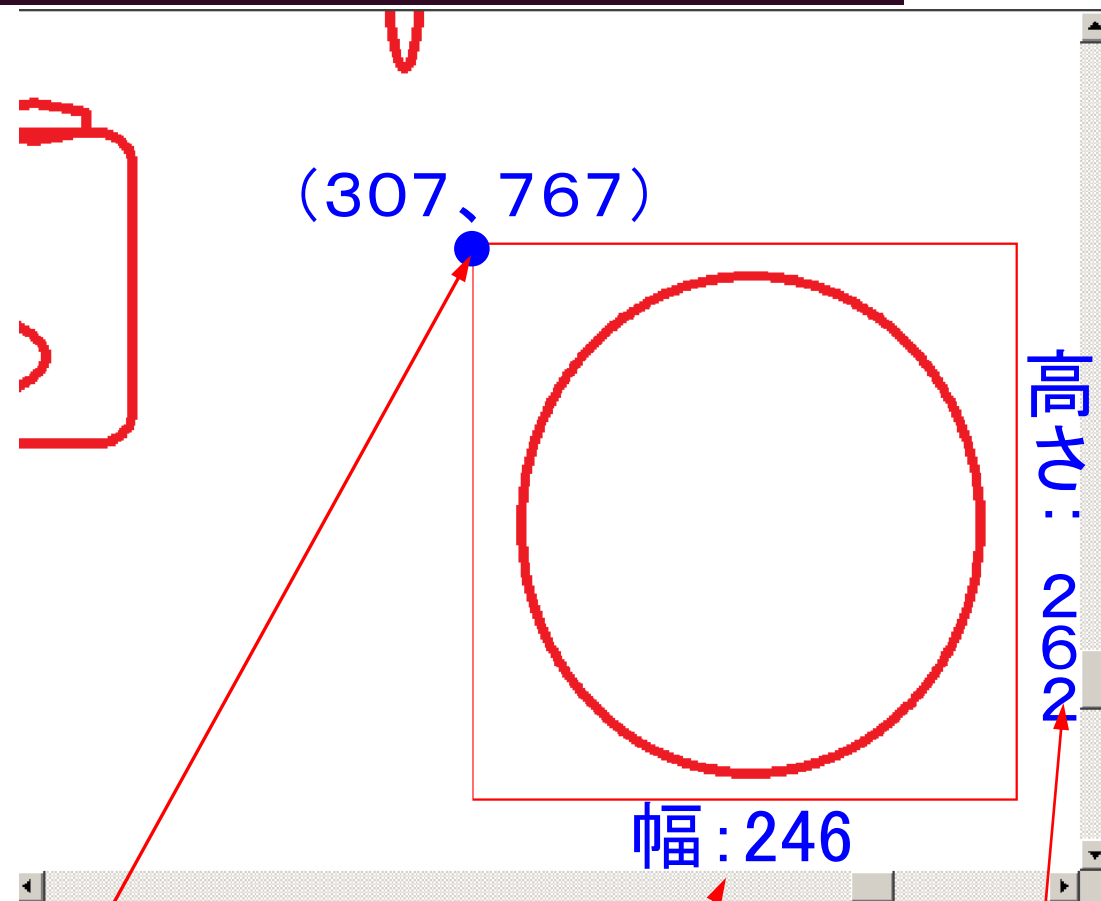
```
aiuser@ubuntu16:~/dlib-19.4/tools/implab/build$ ./implab -c sampledataset.xml ~/
dlib_traindata
aiuser@ubuntu16:~/dlib-19.4/tools/implab/build$
```



データセットの中身を見る

```
aiuser@ubuntu16:~/dlib-19.4/tools/implab/build$ cat sampledataset.xml
```

```
aiuser@ubuntu16:~/dlib-19.4/tools/implab/build$ cat sampledataset.xml
<?xml version='1.0' encoding='ISO-8859-1'?>
<?xml-stylesheet type='text/xsl' href='image_metadata_stylesheet.xsl'?>
<dataset>
<name>implab dataset</name>
<comment>Created by implab tool.</comment>
<images>
<image file='/home/aiuser/dlib_traindata/t001.png'>
  <box top='307' left='767' width='246' height='262' />
</image>
<image file='/home/aiuser/dlib_traindata/t002.png'>
  <box top='64' left='410' width='188' height='194' />
</image>
<image file='/home/aiuser/dlib_traindata/t003.png'>
  <box top='309' left='543' width='229' height='235' />
</image>
<image file='/home/aiuser/dlib_traindata/t004.png'>
  <box top='138' left='370' width='181' height='185' />
</image>
<image file='/home/aiuser/dlib_traindata/t005.png'>
  <box top='393' left='666' width='223' height='244' />
</image>
<image file='/home/aiuser/dlib_traindata/t006.png'>
  <box top='106' left='452' width='218' height='219' />
</image>
<image file='/home/aiuser/dlib_traindata/t007.png'>
  <box top='185' left='157' width='224' height='230' />
</image>
</images>
</dataset>
```



```
<image file='/home/aiuser/dlib_traindata/t001.png'>
  <box top='307' left='767' width='246' height='262' />
```

7つのファイルのデータにおいて、円の特徴量を抽出して学習データを作成

```
aiuser@ubuntu16:~/dlib-19.4/tools/inglab/build$ ../../../../examples/build/train_object_detector -tv sampledataset.xml
```

```
Loading image dataset from metadata file sampledataset.xml
Number of images loaded: 7
objective:      27.5109
objective gap:  27.5039
risk:           27.5039
risk gap:       27.5039
num planes:     3
iter:           1

objective:      10.0937
objective gap:  10.0588
risk:           10.0592
risk gap:       10.0588
num planes:     4
iter:           2
```

```
objective:      0.698053
objective gap:  0.00894003
risk:           0.00885965
risk gap:       0.00894003
num planes:     55
iter:           92
```

```
Saving trained detector to object_detector.svm
Testing detector on training data...
Test detector (precision,recall,AP): 1 1 1
```

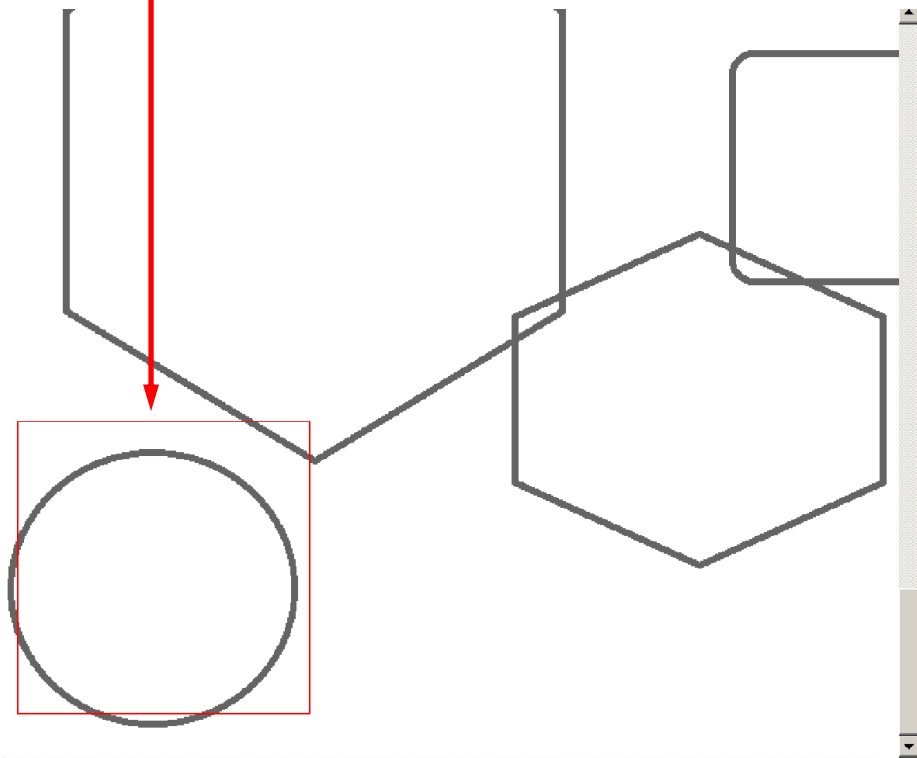
```
Parameters used:
  threads:           4
  C:                  1
  eps:               0.01
  target-size:       6400
  detection window width: 78
  detection window height: 82
  upsample this many times : 0
```

検出対象の特徴量を抽出し、学習データと照合して、円を検出

```
aiuser@ubuntu16:~/dlib-19.4/tools/implab/build$ ../../../../examples/build/train_object_detector ~/dlib_testdata/test01.png
```

```
aiuser@ubuntu16:~/dlib-19.4/tools/implab/build$ ../../../../examples/build/train_object_detector ~/dlib_testdata/test02.png
```

```
Number of detections: 1  
Hit enter to see the next image.
```



```
Number of detections: 1  
Hit enter to see the next image.
```

