FMD_test

August 18, 2022

[ ]:
```
# # FMD   , fit, eval
from FMD import FMD

fmd = FMD("/Users/macbookair_sg/Library/Mobile Documents/com~apple~CloudDocs/
 ↪   /   /      /data_sets/cifar/cifar10_2/automobile")

fmd.set_data_infos()
fmd.set_FM_repres()
fmd.fit(FM_repre_MHP=['FM_mean'],
        alpha_MHP=[['rmw_max', 1000]],
        DAM_MHP=['and'],
        W_MHP=['C'],
        lfmd_MHP=['se_lfmd'],
        fmdc_MHP=['rvalid_fmds_max_wvalid_fmds_min_average'])
fmd.eval()
```

[ ]:
```
# # FMD   , fit, eval
# from FMD import FMD

# cifar10_classes = ['airplane', 'automobile', 'bird', 'cat', 'deer', 'dog',␣
 ↪'frog', 'horse', 'ship', 'truck']
# fmds = {}

# # fmd
# for cifar10_class in cifar10_classes:
#     fmds[f'{cifar10_class}'] = FMD(f"/Users/macbookair_sg/Library/Mobile␣
 ↪Documents/com~apple~CloudDocs/   /   /      /data_sets/cifar/cifar10_2/
 ↪{cifar10_class}")

# # fmd.fit, fmd.eval
# for cifar10_class in cifar10_classes:
#     # fmds[f'{cifar10_class}'].set_data_infos()
#     # fmds[f'{cifar10_class}'].set_FM_repres()
#     fmds[f'{cifar10_class}'].fit(FM_repre_MHP=['FM_mean'],
#             alpha_MHP=[['rmw_max', 1000]],
#             DAM_MHP=['and'],
#             W_MHP=['C'],
```

```
#             lfmd_MHP=['se_lfmd'],
#             fmdc_MHP=['rvalid_fmds_max_wvalid_fmds_min_average'])
#     # fmds[f'{cifar10_class}'].eval()
```

[ ]:
```
# for cifar10_class in cifar10_classes:
#     # print(fmds[i].root_dir)
#     # print(fmds[i].train_dir)
#     # print(fmds[i].rvalid_dir)
#     # print(fmds[i].wvalid_dir)
#     # print(fmds[i].eval_dir)
#     for INST_name in fmds[f'{cifar10_class}'].INST_names:
#         for eval_name in fmds[f'{cifar10_class}'].eval_names:
#             # print(fmds[f'{cifar10_class}'].
 ↪INSTs[INST_name]['AUC'][eval_name])
#             fmds[f'{cifar10_class}'].show_FM_repres(INST_name)
```

[ ]:
```
# # fmd.show_eval_infos
# for fmd in fmds:
#     for INST_name in fmd.INST_names:
#         for eval_name in fmd.eval_names:
#             fmd.show_eval_infos(INST_name, eval_name)
```

[ ]:
```
# show_dir_infos
# fmd.show_dir_infos()
```

[ ]:
```
# show_data_infos
# fmd.show_data_infos()
```

[ ]:
```
# show_FM_repres
# fmd.show_FM_repres()
# for INST_name in fmd.INST_names:
#     fmd.show_FM_repres(INST_name)
```

[ ]:
```
# show_alpha_infos
# fmd.show_alpha_infos()
for INST_name in fmd.INST_names:
    fmd.show_alpha_infos(INST_name)
```

```
[cifar10_2, automobile, [FM_mean 0,rmw_max,1000 and se_lfmd C
rvalid_fmds_max_wvalid_fmds_min_average]]

alpha_slice:           1000
==========================================================================
==
alpha_min:      |    0.0000|    0.0000|    0.0000|    0.0000|    0.0000|
0.0000|
|-----------------------------------------------------------------|
```

```
alpha:          |    0.0201|    0.0115|    0.0204|    0.0376|    0.0120|
0.0594|
alpha_percent:  |       14%|        3%|       14%|        9%|        7%|
11%|
alpha_gage:
|…#|…|…#|…|…|…#|
|-------------------------------------------------------------------|
alpha_max:      |    0.1426|    0.3590|    0.1435|    0.4315|    0.1643|
0.5600|
================================================================================
==
rmw_min:        |     -4096|     -4096|     -4096|     -4096|     -4096|
-4096|
|-------------------------------------------------------------------|
rmw:            |       274|       185|       246|       294|       381|
419|
rmw_percent:    |       53%|       52%|       53%|       54%|       55%|
55%|
rmw_gage:
|…#####|…#####|…#####|…#####|…#####|…#####|
|-------------------------------------------------------------------|
rmw_max:        |      4096|      4096|      4096|      4096|      4096|
4096|
--------------------------------------------------------------------------------
--------------------
```

[ ]:
```
# show_HP
# for INST_name in fmd.INST_names:
#     fmd.show_HP(INST_name)
```

[ ]:
```
# show_AMs
# for INST_name in fmd.INST_names:
#     fmd.show_AMs(INST_name)
```

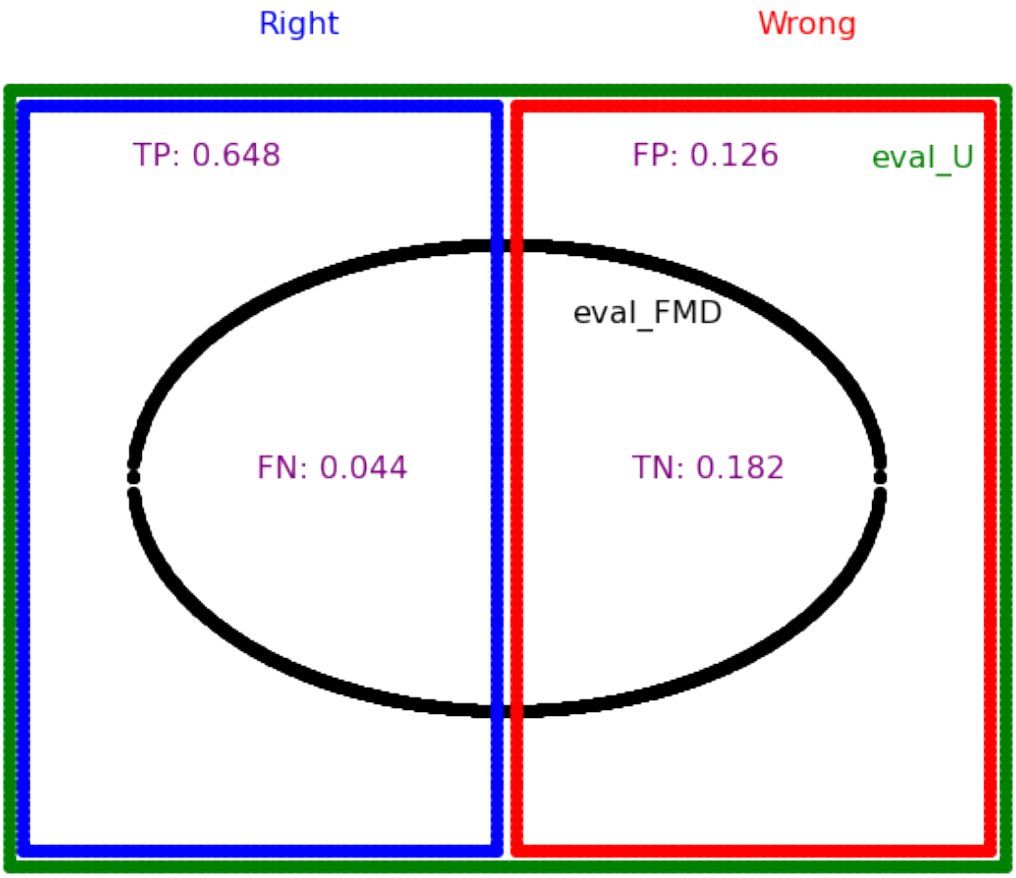
[ ]:
```
# show_DAM_infos
# for INST_name in fmd.INST_names:
#     fmd.show_DAM_infos(INST_name)
```

[ ]:
```
# show_layer_infos
# for INST_name in fmd.INST_names:
#     fmd.show_layer_infos(INST_name)
```

[ ]:
```
# show_fmdc_infos
# for INST_name in fmd.INST_names:
#     fmd.show_fmdc_infos(INST_name)
```

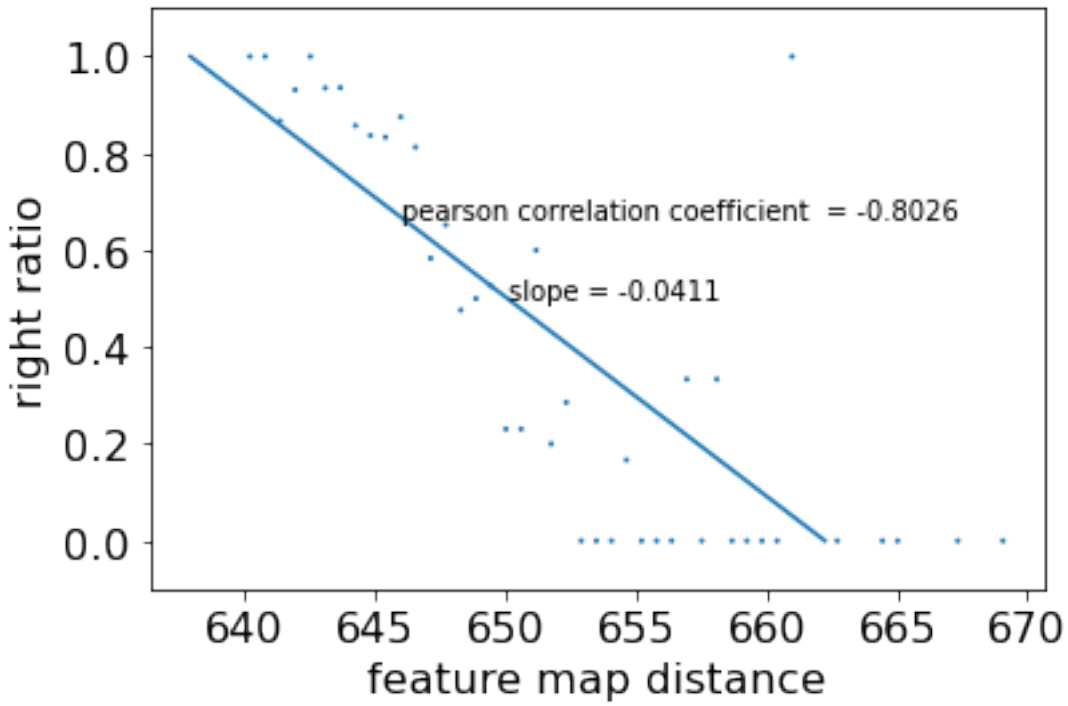
[ ]:
```
# show_eval_infos
eval_name = fmd.eval_names[0]
for INST_name in fmd.INST_names:
    fmd.show_eval_infos(INST_name, eval_name)
```

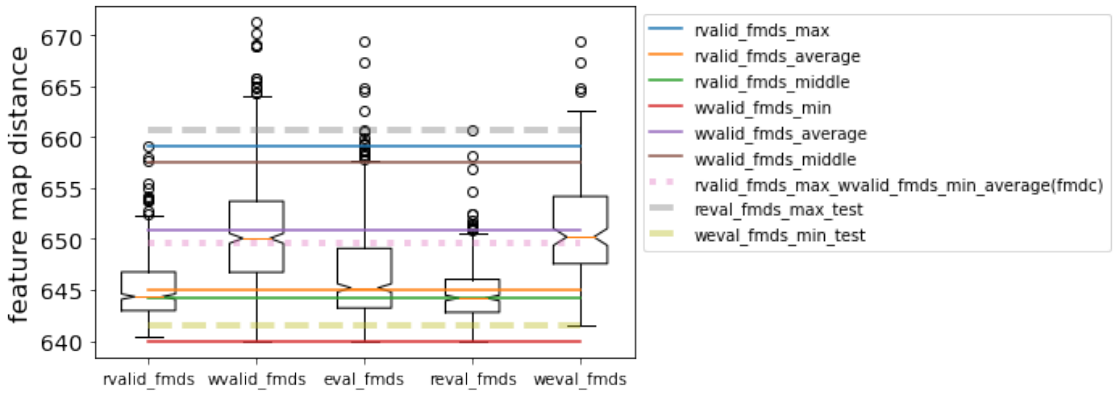
```
[cifar10_2, automobile, [FM_mean 0,rmw_max,1000 and se_lfmd C
rvalid_fmds_max_wvalid_fmds_min_average], test]
```



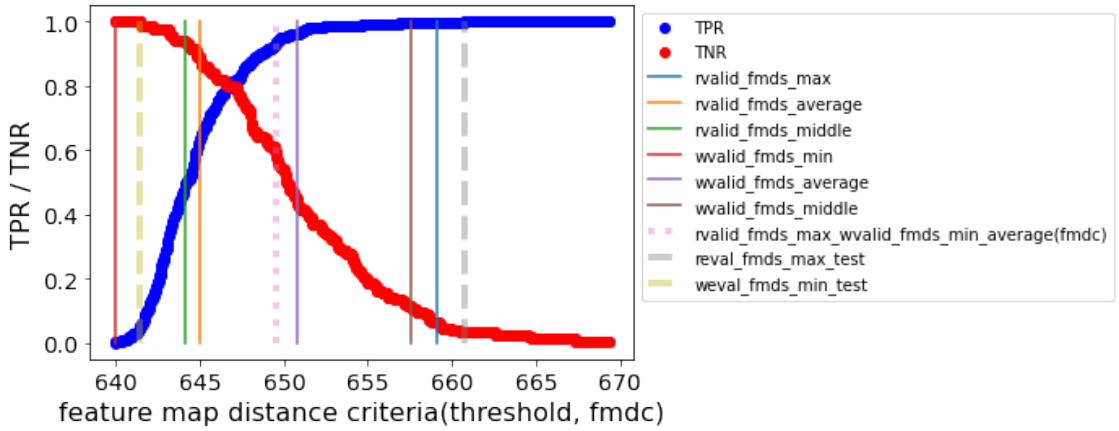

```
[wrong ratio U, N]:                    0.3080
[wrong ratio FMD, NPV]:          0.8053
[recall, TPR]:                         0.9364
[specificity, TNR]:                    0.5909

[FMD ratio(|eval_FMD|/|eval_U|)]:      0.2260
```

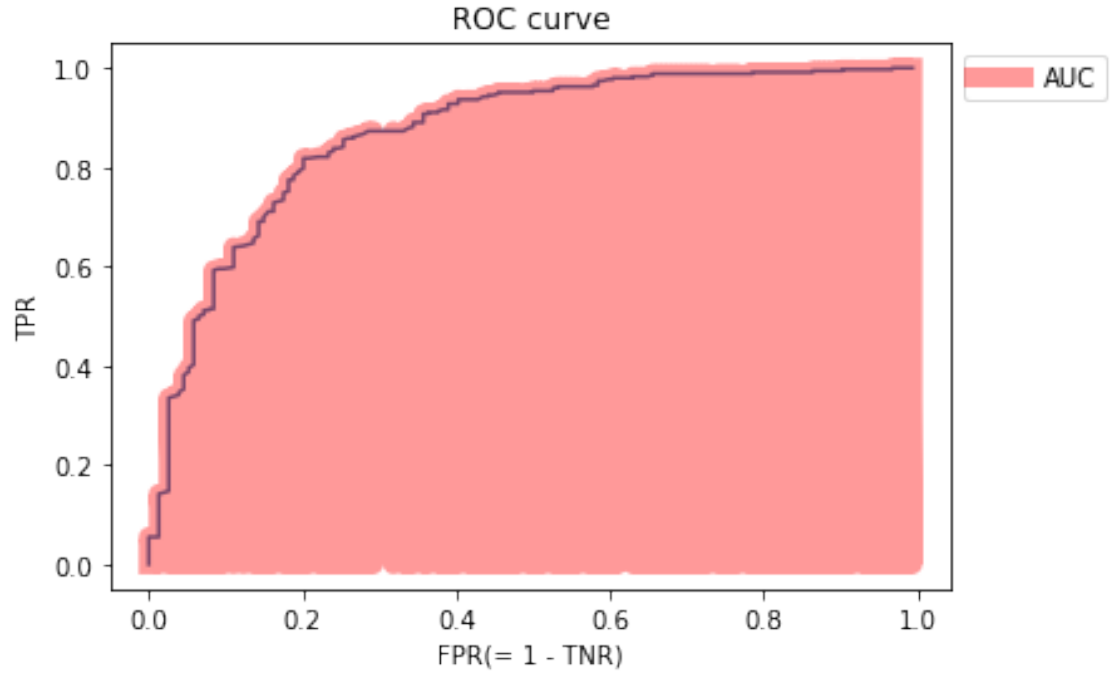




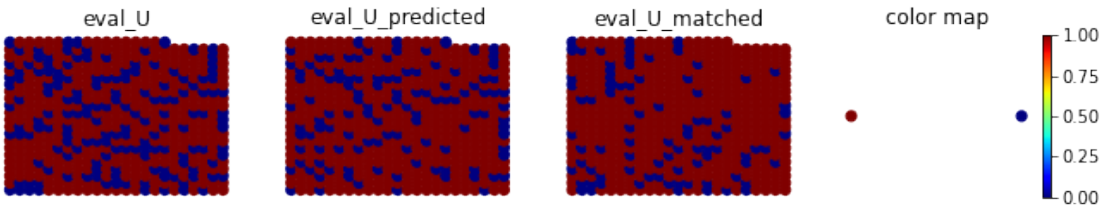

```
rvalid_fmds_max:                                659.1462
rvalid_fmds_average:                            645.0398
rvalid_fmds_middle:                             644.1458
wvalid_fmds_min:                                639.9258
wvalid_fmds_average:                            650.8048
wvalid_fmds_middle:                             657.5733
rvalid_fmds_max_wvalid_fmds_min_average(fmdc):  649.5360
reval_fmds_max_test:                            660.7394
weval_fmds_min_test:                            641.4616
```




```
rvalid_fmds_max:                                659.1462
rvalid_fmds_average:                            645.0398
rvalid_fmds_middle:                             644.1458
wvalid_fmds_min:                                639.9258
wvalid_fmds_average:                            650.8048
wvalid_fmds_middle:                             657.5733
rvalid_fmds_max_wvalid_fmds_min_average(fmdc):  649.5360
reval_fmds_max_test:                            660.7394
weval_fmds_min_test:                            641.4616
```



AUC: 0.8606


eval_U
eval_U_predicted
eval_U_matched
color map
1.00
0.75
0.50
0.25
0.00