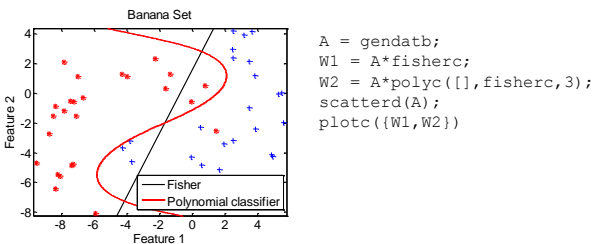


Dissimilarity based Classification Examples

Examples

- 2D space, artificial data
- Dissimilarity matrix
- Dissimilarity space
- PE Space

PRTools Intro



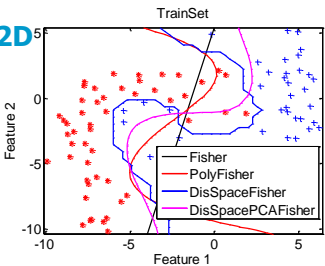
PRTools Intro

```
> testc(A,{W1,W2})
```

Test results for

| | clsf_1 : Fisher | clsf_2 : Polynomial classifier |
|------------|-----------------|--------------------------------|
| Banana Set | 0.220 | 0.120 |

DisTools Intro 2D



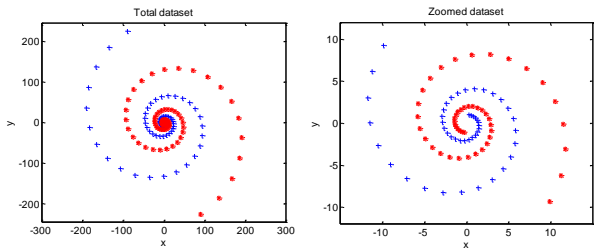
DisTools Intro 2D

```
testc({AT,AS},W)
```

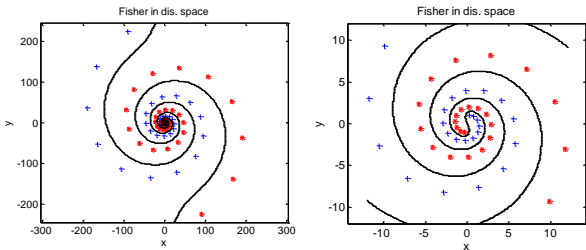
clsf_1 : Fisher
clsf_2 : PolyFisher
clsf_3 : DisSpaceFisher
clsf_4 : DisSpacePCAFisher

| | clsf_1 | clsf_2 | clsf_3 | clsf_4 |
|----------|--------|--------|--------|--------|
| TrainSet | 0.140 | 0.090 | 0.000 | 0.080 |
| TestSet | 0.180 | 0.090 | 0.010 | 0.060 |

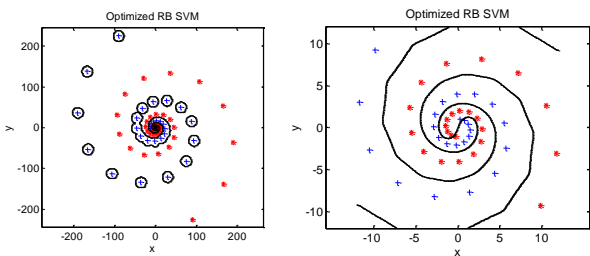
Long Spiral Example



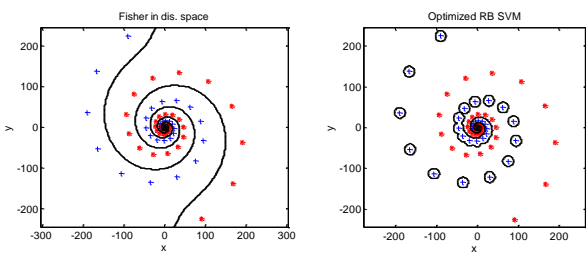
Fisher’s Linear Discriminant in Dissimilarity space



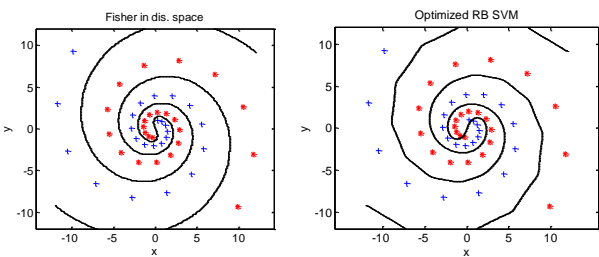
Radial Basis Support Vector Machine



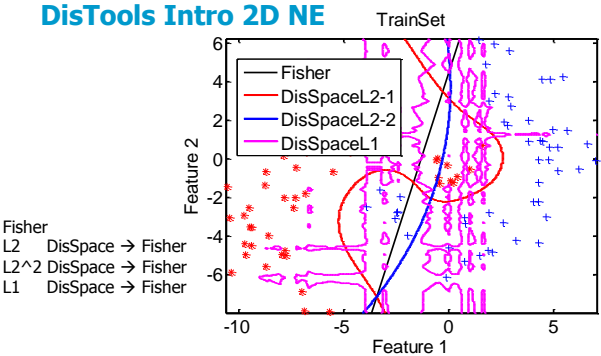
Global results compared



Central results compared

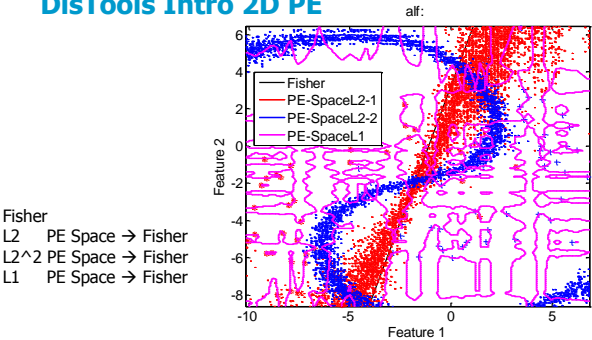


DisTools Intro 2D NE

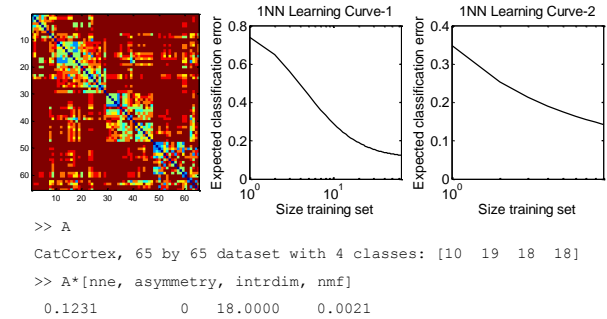


Fisher
L2 DisSpace → Fisher
L2^2 DisSpace → Fisher
L1 DisSpace → Fisher

DisTools Intro 2D PE



DisTools Intro Dissimilarity Matrix



DisTools Intro Dissimilarity Matrix

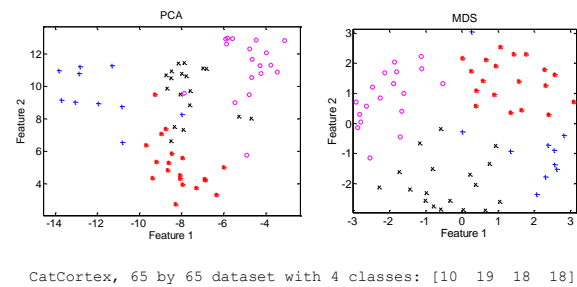
```
>> [AT,AS] = gendat(A,0.5);
>> W1 = AT*knnc;
>> W2 = AT*parzendc;
>> W3 = AT*parzendc([],mean(mean(AT)));
>> W3 = setname(W3,'ParzenD-h');
>> testc([AT,AS],{W1,W2,W3})

Test results for
clsf_1 : K-NN
clsf_2 : ParzenD
clsf_3 : ParzenD-h

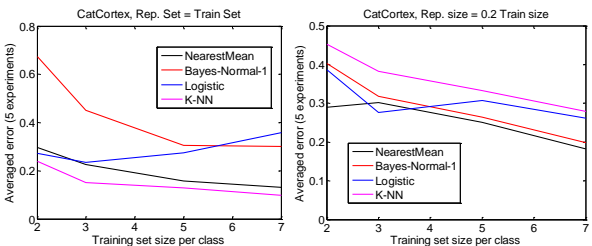
TrainSet      clsf_1  clsf_2  clsf_3
TestSet      0.000  0.000  0.040
              0.040  0.020  0.050
```



DisTools Intro Dissimilarity Space



DisTools Intro Dissimilarity Space



DisTools Intro Dissimilarity Space

```
>> [AT,AS] = genddat(A,0.5);
>> U = {nmc,ldc,loglc,knnc};
>> W = AT*U;
>> testc([AT,AS],W)

Test results for
clsf_1 : NearestMean
clsf_2 : Bayes-Normal-1
clsf_3 : Logistic
clsf_4 : K-NN

TrainSet      clsf_1  clsf_2  clsf_3  clsf_4
TestSet      0.028  0.000  0.000  0.000
              0.050  0.239  0.350  0.000
```



DisTools Intro Dissimilarity Space

```
>> U = {nmc,ldc,loglc,knnc};
>> crossval(A,U,5,10)

5-fold cross validation result for
  clsf_1 : NearestMean
  clsf_2 : Bayes-Normal-1
  clsf_3 : Logistic
  clsf_4 : K-NN

CatCortex      clsf_1  clsf_2  clsf_3  clsf_4
              0.236  0.302  0.276  0.288
```

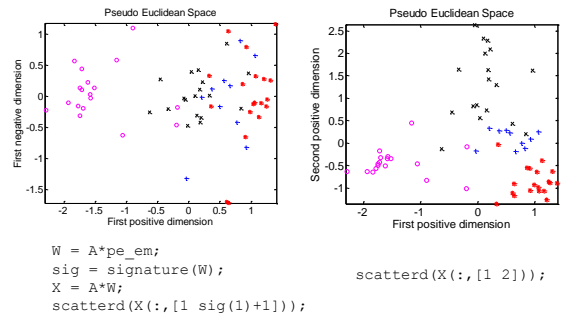
25 June 2013

The Dissimilarity Representation for Classification

148



DisTools Intro PE Space



25 June 2013

The Dissimilarity Representation for Classification

149



DisTools Intro PE Space

```
>> U = {pe_nmc,ldc,pe_knnc,pe_parzenc};
>> Wass = euspace(W,'ass'); Xass = A*Wass;
>> Wpos = euspace(W,'pos'); Xpos = A*Wpos;
>> Wneg = euspace(W,'neg'); Xneg = A*Wneg;
>> crossval({X,Xass,Xpos,Xneg},U,5,5)

5-fold cross validation result for
  clsf_1 : PE Nearest Mean
  clsf_2 : Bayes-Normal-1
  clsf_3 : PE K-NN Classifier
  clsf_4 : PE Parzen Classifier

PE Space      clsf_1  clsf_2  clsf_3  clsf_4
              0.075  0.304  0.123  0.123
Ass Space     0.080  0.304  0.059  0.356
Pos Space     0.088  0.368  0.069  0.094
Neg Space     0.898  0.900  0.339  0.803
```

