**Training Set**

**Parenchymal area of PTCs**

Feature name: **F**:（Fisher）

---------------------------

Teta4 1.8516

Teta3 0.8809

Perc.90% 0.8500

S(3,-3)SumAverg 0.8311

Perc.01% 0.8164

Horzl\_RLNonUni 0.7821

Perc.10% 0.7791

S(3,0)DifEntrp 0.7681

S(4,0)SumAverg 0.7591

S(2,-2)SumAverg 0.7566

\* b11 report file [PCA analysis] <2025-05-12 16:19:22>

\* Data file name: ""

\* Selected features [10 out of 10]

Teta4 [#1/#1]; p.mean= 1.08406E-001, p.std= 2.01792E-001

Teta3 [#2/#2]; p.mean= 6.92720E-001, p.std= 3.32987E-001

Perc.90% [#3/#3]; p.mean= 1.41769E+002, p.std= 1.90480E+001

S(3,-3)SumAverg [#4/#4]; p.mean= 6.73562E+001, p.std= 9.30164E+000

Perc.01% [#5/#5]; p.mean= 1.20885E+002, p.std= 1.96027E+001

Horzl\_RLNonUni [#6/#6]; p.mean= 1.47831E+001, p.std= 6.61457E+000

Perc.10% [#7/#7]; p.mean= 1.24692E+002, p.std= 1.83734E+001

S(3,0)DifEntrp [#8/#8]; p.mean= 5.41589E-001, p.std= 1.26671E-001

S(4,0)SumAverg [#9/#9]; p.mean= 6.72178E+001, p.std= 9.18889E+000

S(2,-2)SumAverg [#10/#10]; p.mean= 6.71476E+001, p.std= 9.16001E+000

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

1.30621E+003

5.54638E+001

1.66941E+001

3.58486E+000

1.08619E+000

2.56426E-001

1.17463E-001

3.50756E-002

7.04935E-003

3.27238E-003

Linear dimensionality: 3

> Fisher coefficient, F = 0.8

> 1-NN classification of MEFs

Missclassified data vectors: 28/52[or 53.85%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

6.81342E-001

7.27347E-015

1.77739E-015

2.61488E-016

2.31632E-018

-7.23528E-017

-1.70185E-016

-8.04253E-016

-2.05699E-015

-2.91103E-014

Linear separability: 0.68

LDA dimensionality: 1

> Fisher coefficient, F = 9.0

> 1-NN classification of MDFs

Missclassified data vectors:4/52[or 7.69%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.248 11 0.452-0.4 0.5

50 0.230 20 0.005 0.0 0.0

100 0.243 12 0.781-0.8 0.8

150 0.208 6 0.226 0.2-0.2

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 2.98E-001

10 2.54E-001

20 2.53E-001

30 2.53E-001

40 2.53E-001

50 2.53E-001

> Missclassified f. vectors: 4/52 [or 7.69%]

Sample No: 2; Category: 1; ClassResult: 2

Sample No: 6; Category: 1; ClassResult: 2

> Fisher coefficient, F = 9.8

Feature name: **P:**（POE+ACC）

---------------------------

S(2,0)InvDfMom 0.3350

S(0,5)DifEntrp 0.3694

Teta4 0.3728

S(2,0)SumAverg 0.4037

S(3,0)InvDfMom 0.4535

S(5,5)Correlat 0.4575

S(5,0)DifEntrp 0.4590

S(0,5)DifVarnc 0.4638

S(1,0)Correlat 0.4662

Kurtosis 0.5000

\* b11 report file [PCA analysis] <2025-05-12 19:40:36>

\* Data file name: ""

\* Selected features [10 out of 10]

S(2,0)InvDfMom [#1/#1]; p.mean= 5.34995E-001, p.std= 1.54670E-001

S(0,5)DifEntrp [#2/#2]; p.mean= 4.94199E-001, p.std= 2.12711E-001

Teta4 [#3/#3]; p.mean= 1.08406E-001, p.std= 2.01792E-001

S(2,0)SumAverg [#4/#4]; p.mean= 6.70429E+001, p.std= 9.10058E+000

S(3,0)InvDfMom [#5/#5]; p.mean= 4.37344E-001, p.std= 1.60656E-001

S(5,5)Correlat [#6/#6]; p.mean=-3.31345E-001, p.std= 4.76751E-001

S(5,0)DifEntrp [#7/#7]; p.mean= 5.08809E-001, p.std= 1.62699E-001

S(0,5)DifVarnc [#8/#8]; p.mean= 1.31166E+000, p.std= 1.71116E+000

S(1,0)Correlat [#9/#9]; p.mean= 8.15211E-001, p.std= 8.71660E-002

Kurtosis [#10/#10]; p.mean=-1.63355E-001, p.std= 8.91305E-001

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

8.28942E+001

2.99948E+000

7.12233E-001

2.16701E-001

4.69488E-002

3.21082E-002

2.07045E-002

1.44347E-002

2.82305E-003

4.41185E-004

Linear dimensionality: 3

> Fisher coefficient, F = 0.7

> 1-NN classification of MEFs

Missclassified data vectors: 24/52 [or 46.15%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

6.56747E-001

3.39235E-016

1.07150E-016

5.41966E-017

3.31944E-017

5.86087E-018

-2.64812E-017

-8.21653E-017

-1.12819E-016

-1.66599E-016

Linear separability: 0.66

LDA dimensionality: 1

> Fisher coefficient, F = 8.1

> 1-NN classification of MDFs

Missclassified data vectors: 10/52 [or 19.23%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.250 21 0.468-0.5 0.5

50 0.139 19 0.014 0.0 0.0

100 0.138 25 0.005 0.0 0.0

150 0.197 4 0.160 0.2-0.2

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

Sample No: 12; Category: 2; ClassResult: 1

IterCount rms error

0 2.53E-001

10 1.87E-001

20 1.87E-001

27 1.87E-001

> Missclassified f. vectors: 2/52 [or 3.85%]

Sample No: 2; Category: 1; ClassResult: 2

> Fisher coefficient, F = 24.4

Feature name: **MI:**

---------------------------

S(3,0)InvDfMom 0.4104

Teta4 0.3586

Kurtosis 0.3013

S(0,5)DifEntrp 0.2226

S(2,0)InvDfMom 0.2163

S(5,0)DifEntrp 0.1655

S(5,5)Correlat 0.1652

S(1,0)Correlat 0.1451

S(0,5)DifVarnc 0.1088

S(2,0)SumAverg 0.0918

\* b11 report file [PCA analysis] <2025-05-12 19:48:08>

\* Data file name: ""

\* Selected features [10 out of 10]

S(3,0)InvDfMom [#1/#1]; p.mean= 4.37344E-001, p.std= 1.60656E-001

Teta4 [#2/#2]; p.mean= 1.08406E-001, p.std= 2.01792E-001

Kurtosis [#3/#3]; p.mean=-1.63355E-001, p.std= 8.91305E-001

S(0,5)DifEntrp [#4/#4]; p.mean= 4.94199E-001, p.std= 2.12711E-001

S(2,0)InvDfMom [#5/#5]; p.mean= 5.34995E-001, p.std= 1.54670E-001

S(5,0)DifEntrp [#6/#6]; p.mean= 5.08809E-001, p.std= 1.62699E-001

S(5,5)Correlat [#7/#7]; p.mean=-3.31345E-001, p.std= 4.76751E-001

S(1,0)Correlat [#8/#8]; p.mean= 8.15211E-001, p.std= 8.71660E-002

S(0,5)DifVarnc [#9/#9]; p.mean= 1.31166E+000, p.std= 1.71116E+000

S(2,0)SumAverg [#10/#10]; p.mean= 6.70429E+001, p.std= 9.10058E+000

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

8.28942E+001

2.99948E+000

7.12233E-001

2.16701E-001

4.69488E-002

3.21082E-002

2.07045E-002

1.44347E-002

2.82305E-003

4.41185E-004

Linear dimensionality: 3

> Fisher coefficient, F = 0.7

> 1-NN classification of MEFs

Missclassified data vectors: 18/52[or 34.62%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

6.56747E-001

9.76112E-017

8.06993E-017

1.20074E-017

5.86313E-018

-4.21955E-018

-1.66352E-017

-3.15455E-017

-7.79884E-017

-9.18132E-017

Linear separability: 0.66

LDA dimensionality: 1

> Fisher coefficient, F = 6.6

> 1-NN classification of MDFs

Missclassified data vectors: 4/52 [or 7.69%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.253 20 0.487-0.5 0.5

50 0.284 7 0.154 0.2-0.2

100 0.138 12 0.835-0.8 0.8

150 0.193 4 0.170 0.2-0.2

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 2.53E-001

10 1.87E-001

20 1.87E-001

30 1.87E-001

40 1.87E-001

48 1.87E-001

> Missclassified f. vectors: 4/52 [or 7.69%]

Sample No: 9; Category: 1; ClassResult: 2

Sample No: 16; Category: 1; ClassResult: 2

> Fisher coefficient, F = 11.3

**Calcified area of PTCs**

Feature name: **F:**（Fisher）

---------------------------

S(0,4)Correlat 1.3481

Kurtosis 1.1447

S(5,5)SumAverg 0.8692

S(5,-5)SumAverg 0.8449

S(5,0)DifVarnc 0.8442

S(4,4)SumVarnc 0.7753

S(4,0)SumVarnc 0.7312

S(3,0)DifVarnc 0.7308

Horzl\_RLNonUni 0.7225

S(4,0)DifVarnc 0.7105

\* b11 report file [PCA analysis] <2025-05-12 20:20:09>

\* Data file name: ""

\* Selected features [10 out of 10]

S(0,4)Correlat [#1/#1]; p.mean=-1.02030E-001, p.std= 2.75306E-001

Kurtosis [#2/#2]; p.mean= 9.75680E+000, p.std= 1.15018E+001

S(5,5)SumAverg [#3/#3]; p.mean= 6.87268E+001, p.std= 6.48907E+001

S(5,-5)SumAverg [#4/#4]; p.mean= 6.83459E+001, p.std= 6.45543E+001

S(5,0)DifVarnc [#5/#5]; p.mean= 2.53834E+000, p.std= 6.81738E+000

S(4,4)SumVarnc [#6/#6]; p.mean= 4.12448E+000, p.std= 1.24038E+001

S(4,0)SumVarnc [#7/#7]; p.mean= 3.00506E+000, p.std= 7.02474E+000

S(3,0)DifVarnc [#8/#8]; p.mean= 2.16674E+000, p.std= 4.81635E+000

Horzl\_RLNonUni [#9/#9]; p.mean= 6.29088E+000, p.std= 5.39174E+000

S(4,0)DifVarnc [#10/#10]; p.mean= 2.55400E+000, p.std= 6.02002E+000

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

8.42615E+003

3.31381E+002

7.96863E+001

6.19675E+000

3.35211E+000

1.16793E+000

5.52504E-001

6.72804E-002

4.74329E-002

2.25588E-002

Linear dimensionality: 3

> Fisher coefficient, F = 0.9

> 1-NN classification of MEFs

Missclassified data vectors: 20/52[or 38.46%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

6.48933E-001

2.44072E-013

2.63764E-014

9.13188E-015

2.05528E-015

-2.46987E-017

-1.69616E-016

-1.33011E-014

-2.42012E-014

-5.88546E-014

Linear separability: 0.65

LDA dimensionality: 1

> Fisher coefficient, F = 7.8

> 1-NN classification of MDFs

Missclassified data vectors: 6/52 [or 11.54%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.247 13 0.456-0.5 0.5

50 0.235 2 0.056 0.1-0.1

100 0.149 12 0.557-0.6 0.6

150 0.150 17 0.011 0.0 0.0

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 2.09E-001

10 2.01E-001

20 1.78E-001

30 1.61E-001

40 1.45E-001

50 1.42E-001

> Missclassified f. vectors: 4/52 [or 7.69%]

Sample No: 2; Category: 1; ClassResult: 2

Sample No: 24; Category: 2; ClassResult: 1

> Fisher coefficient, F = 12.3

Feature name: **P:**（POE+ACC）

---------------------------

Kurtosis 0.4100

Horzl\_RLNonUni 0.5502

S(0,4)Correlat 0.5769

S(4,0)SumVarnc 0.6728

S(5,5)SumAverg 0.6767

S(4,4)SumVarnc 0.7057

S(5,0)DifVarnc 0.7218

S(5,-5)SumAverg 0.7273

S(4,0)DifVarnc 0.7608

S(3,0)DifVarnc 0.7859

\* b11 report file [PCA analysis] <2025-05-12 20:23:54>

\* Data file name: ""

\* Selected features [10 out of 10]

Kurtosis [#1/#1]; p.mean= 9.75680E+000, p.std= 1.15018E+001

Horzl\_RLNonUni [#2/#2]; p.mean= 6.29088E+000, p.std= 5.39174E+000

S(0,4)Correlat [#3/#3]; p.mean=-1.02030E-001, p.std= 2.75306E-001

S(4,0)SumVarnc [#4/#4]; p.mean= 3.00506E+000, p.std= 7.02474E+000

S(5,5)SumAverg [#5/#5]; p.mean= 6.87268E+001, p.std= 6.48907E+001

S(4,4)SumVarnc [#6/#6]; p.mean= 4.12448E+000, p.std= 1.24038E+001

S(5,0)DifVarnc [#7/#7]; p.mean= 2.53834E+000, p.std= 6.81738E+000

S(5,-5)SumAverg [#8/#8]; p.mean= 6.83459E+001, p.std= 6.45543E+001

S(4,0)DifVarnc [#9/#9]; p.mean= 2.55400E+000, p.std= 6.02002E+000

S(3,0)DifVarnc [#10/#10]; p.mean= 2.16674E+000, p.std= 4.81635E+000

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

8.42615E+003

3.31381E+002

7.96863E+001

6.19675E+000

3.35211E+000

1.16793E+000

5.52504E-001

6.72804E-002

4.74329E-002

2.25588E-002

Linear dimensionality: 3

> Fisher coefficient, F = 0.9

> 1-NN classification of MEFs

Missclassified data vectors: 18/52 [or 34.62%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

6.48933E-001

8.82614E-013

5.31265E-014

1.82862E-016

2.43077E-017

-7.85402E-017

-1.60098E-016

-6.35668E-016

-7.30945E-015

-4.41287E-014

Linear separability: 0.65

LDA dimensionality: 1

> Fisher coefficient, F = 7.8

> 1-NN classification of MDFs

Missclassified data vectors: 4/52 [or 7.69%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.251 4 0.542 0.5-0.5

50 0.167 11 0.067-0.1 0.1

100 0.151 14 0.022 0.0 0.0

150 0.146 3 0.028 0.0 0.0

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 2.10E-001

10 2.04E-001

20 1.85E-001

30 1.63E-001

40 1.57E-001

50 1.56E-001

> Missclassified f. vectors: 4/52[or 7.69%]

Sample No: 12; Category: 2; ClassResult: 1

> Fisher coefficient, F = 11.5

Feature name: **MI:**

---------------------------

S(0,4)Correlat 0.2938

S(3,0)DifVarnc 0.2565

S(4,0)SumVarnc 0.2338

S(4,0)DifVarnc 0.2161

Kurtosis 0.2006

Horzl\_RLNonUni 0.1786

S(4,4)SumVarnc 0.1770

S(5,0)DifVarnc 0.1770

S(5,5)SumAverg 0.1307

S(5,-5)SumAverg 0.1307

\* b11 report file [PCA analysis] <2025-05-12 20:27:15>

\* Data file name: ""

\* Selected features [10 out of 10]

S(0,4)Correlat [#1/#1]; p.mean=-1.02030E-001, p.std= 2.75306E-001

S(3,0)DifVarnc [#2/#2]; p.mean= 2.16674E+000, p.std= 4.81635E+000

S(4,0)SumVarnc [#3/#3]; p.mean= 3.00506E+000, p.std= 7.02474E+000

S(4,0)DifVarnc [#4/#4]; p.mean= 2.55400E+000, p.std= 6.02002E+000

Kurtosis [#5/#5]; p.mean= 9.75680E+000, p.std= 1.15018E+001

Horzl\_RLNonUni [#6/#6]; p.mean= 6.29088E+000, p.std= 5.39174E+000

S(4,4)SumVarnc [#7/#7]; p.mean= 4.12448E+000, p.std= 1.24038E+001

S(5,0)DifVarnc [#8/#8]; p.mean= 2.53834E+000, p.std= 6.81738E+000

S(5,5)SumAverg [#9/#9]; p.mean= 6.87268E+001, p.std= 6.48907E+001

S(5,-5)SumAverg [#10/#10]; p.mean= 6.83459E+001, p.std= 6.45543E+001

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

8.42615E+003

3.31381E+002

7.96863E+001

6.19675E+000

3.35211E+000

1.16793E+000

5.52504E-001

6.72804E-002

4.74329E-002

2.25588E-002

Linear dimensionality: 2

> Fisher coefficient, F = 0.6

> 1-NN classification of MEFs

Missclassified data vectors: 22/52 [or 42.31%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

6.48933E-001

5.10952E-013

2.87331E-015

2.77060E-016

5.11925E-017

-1.07705E-016

-3.30744E-016

-2.64316E-015

-3.25859E-015

-1.32614E-014

Linear separability: 0.65

LDA dimensionality: 1

> Fisher coefficient, F = 5.6

> 1-NN classification of MDFs

Missclassified data vectors: 12/52 [or 23.08%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.251 12 0.471-0.5 0.5

50 0.110 10 0.043 0.0 0.0

100 0.178 12 0.607-0.6 0.6

150 0.122 5 0.030 0.0 0.0

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 2.14E-001

10 2.04E-001

20 1.95E-001

30 1.60E-001

40 1.52E-001

50 1.45E-001

> Missclassified f. vectors:2/52[or 3.85%]

Sample No: 26; Category: 2; ClassResult: 1

> Fisher coefficient, F = 8.3

**Testing Set**

**Parenchymal area of PTCs**

Feature name: **F:**

---------------------------

S(4,0)DifVarnc 2.0714

S(4,0)DifEntrp 1.7789

Teta4 1.6267

S(5,0)DifVarnc 1.5503

S(5,0)DifEntrp 1.3942

S(3,0)DifEntrp 1.3926

Perc.90% 1.1806

Perc.01% 1.1621

Perc.10% 1.1287

S(3,-3)SumAverg 1.1118

\* b11 report file [PCA analysis] <2025-05-13 0:53:29>

\* Data file name: ""

\* Selected features [10 out of 10]

S(4,0)DifVarnc [#1/#1]; p.mean= 1.23380E+000, p.std= 9.20468E-001

S(4,0)DifEntrp [#2/#2]; p.mean= 5.52751E-001, p.std= 1.11522E-001

Teta4 [#3/#3]; p.mean= 1.08296E-001, p.std= 2.08900E-001

S(5,0)DifVarnc [#4/#4]; p.mean= 1.00538E+000, p.std= 7.47220E-001

S(5,0)DifEntrp [#5/#5]; p.mean= 4.86335E-001, p.std= 1.56956E-001

S(3,0)DifEntrp [#6/#6]; p.mean= 5.22359E-001, p.std= 1.20535E-001

Perc.90% [#7/#7]; p.mean= 1.39304E+002, p.std= 1.84204E+001

Perc.01% [#8/#8]; p.mean= 1.18957E+002, p.std= 1.98780E+001

Perc.10% [#9/#9]; p.mean= 1.23087E+002, p.std= 1.87566E+001

S(3,-3)SumAverg [#10/#10]; p.mean= 6.64405E+001, p.std= 9.43758E+000

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

1.14455E+003

2.81194E+001

2.18130E+000

1.24981E+000

5.58328E-001

1.26211E-001

2.64377E-002

9.16520E-003

4.15247E-003

4.29242E-004

Linear dimensionality: 2

> Fisher coefficient, F = 1.2

> 1-NN classification of MEFs

Missclassified data vectors: 12/23 [or 52.17%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

6.82691E-001

6.61318E-015

1.20202E-015

2.33655E-016

1.31623E-016

-1.63093E-017

-1.01959E-016

-1.32192E-016

-6.29977E-016

-4.51277E-015

Linear separability: 0.68

LDA dimensionality: 1

> Fisher coefficient, F = 9.0

> 1-NN classification of MDFs

Missclassified data vectors: 2/23 [or 8.7%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.249 1 0.549 0.6-0.5

50 0.182 16 0.066-0.1 0.1

100 0.249 22 0.071-0.1 0.1

150 0.307 20 0.060-0.1 0.1

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 2.82E-001

10 2.81E-001

20 2.81E-001

30 2.81E-001

40 2.81E-001

50 2.81E-001

> Missclassified f. vectors: 2/23 [or 8.70%]

Sample No: 9; Category: 1; ClassResult: 2

Sample No: 11; Category: 2; ClassResult: 1

> Fisher coefficient, F = 8.5

Feature name: **P:** (POE+ACC)

---------------------------

Horzl\_Fraction 0.3103

S(3,3)Entropy 0.3632

S(2,0)SumAverg 0.3907

Teta4 0.3922

S(4,-4)Correlat 0.4205

S(3,0)InvDfMom 0.4224

S(0,5)DifEntrp 0.4250

Perc.90% 0.4476

S(5,5)Correlat 0.4508

Kurtosis 0.5217

\* b11 report file [PCA analysis] <2025-05-13 1:04:26>

\* Data file name: ""

\* Selected features [10 out of 10]

Horzl\_Fraction [#1/#1]; p.mean= 5.81770E-001, p.std= 1.55774E-001

S(3,3)Entropy [#2/#2]; p.mean= 1.12197E+000, p.std= 2.03557E-001

S(2,0)SumAverg [#3/#3]; p.mean= 6.62627E+001, p.std= 9.27366E+000

Teta4 [#4/#4]; p.mean= 1.08296E-001, p.std= 2.08900E-001

S(4,-4)Correlat [#5/#5]; p.mean=-2.61222E-001, p.std= 5.62545E-001

S(3,0)InvDfMom [#6/#6]; p.mean= 4.51928E-001, p.std= 1.59867E-001

S(0,5)DifEntrp [#7/#7]; p.mean= 4.89443E-001, p.std= 1.77855E-001

Perc.90% [#8/#8]; p.mean= 1.39304E+002, p.std= 1.84204E+001

S(5,5)Correlat [#9/#9]; p.mean=-3.36589E-001, p.std= 4.84685E-001

Kurtosis [#10/#10]; p.mean=-2.76039E-001, p.std= 8.17587E-001

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

4.23792E+002

1.70028E+000

6.37351E-001

3.28060E-001

1.31256E-001

5.08653E-002

3.58790E-002

1.80805E-002

4.96122E-003

9.76119E-004

Linear dimensionality: 1

> Fisher coefficient, F = 1.2

> 1-NN classification of MEFs

Missclassified data vectors: 10/23 [or 43.48%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

7.06187E-001

2.50931E-015

4.63627E-016

4.50642E-017

6.28347E-018

-1.02698E-017

-2.23662E-017

-8.98621E-017

-1.97739E-016

-5.94293E-015

Linear separability: 0.71

LDA dimensionality: 1

> Fisher coefficient, F = 10.1

> 1-NN classification of MDFs

Missclassified data vectors: 5/23 [or 21.74%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.250 10 0.470-0.5 0.5

50 0.170 20 0.005 0.0 0.0

100 0.167 13 0.002 0.0 0.0

150 0.004 13 0.002 0.0 0.0

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 1.98E-001

10 1.98E-001

20 1.98E-001

21 1.98E-001

> Missclassified f. vectors: 1/23 [or 4.35%]

Sample No: 11; Category: 2; ClassResult: 1

> Fisher coefficient, F = 21.3

Feature name: **MI:**

---------------------------

S(3,0)InvDfMom 0.6276

S(3,3)DifVarnc 0.5506

S(1,1)Correlat 0.4396

S(0,3)AngScMom 0.4208

S(5,0)InvDfMom 0.3996

Vertl\_ShrtREmp 0.3941

Kurtosis 0.3757

S(4,0)DifVarnc 0.3686

Teta4 0.3667

S(3,0)AngScMom 0.3623

\* b11 report file [PCA analysis] <2025-05-13 0:58:56>

\* Data file name: ""

\* Selected features [10 out of 10]

S(3,0)InvDfMom [#1/#1]; p.mean= 4.51928E-001, p.std= 1.59867E-001

S(3,3)DifVarnc [#2/#2]; p.mean= 1.24995E+000, p.std= 1.05860E+000

S(1,1)Correlat [#3/#3]; p.mean= 6.83670E-001, p.std= 1.81315E-001

S(0,3)AngScMom [#4/#4]; p.mean= 7.69507E-002, p.std= 3.06559E-002

S(5,0)InvDfMom [#5/#5]; p.mean= 3.45899E-001, p.std= 2.04656E-001

Vertl\_ShrtREmp [#6/#6]; p.mean= 6.54041E-001, p.std= 1.45531E-001

Kurtosis [#7/#7]; p.mean=-2.76039E-001, p.std= 8.17587E-001

S(4,0)DifVarnc [#8/#8]; p.mean= 1.23380E+000, p.std= 9.20468E-001

Teta4 [#9/#9]; p.mean= 1.08296E-001, p.std= 2.08900E-001

S(3,0)AngScMom [#10/#10]; p.mean= 8.26962E-002, p.std= 3.16438E-002

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

1.41825E+000

7.90643E-001

4.83198E-001

4.89353E-002

3.01266E-002

2.01628E-002

1.00878E-002

1.50293E-003

4.40156E-004

6.57796E-005

Linear dimensionality: 6

> Fisher coefficient, F = 0.6

> 1-NN classification of MEFs

Missclassified data vectors: 8/23 [or 34.78%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

7.96422E-001

3.36942E-017

1.06631E-017

6.82237E-018

-1.70275E-019

-1.70601E-018

-4.45592E-018

-2.74947E-017

-4.93599E-017

-2.36333E-016

Linear separability: 0.80

LDA dimensionality: 1

> Fisher coefficient, F = 16.4

> 1-NN classification of MDFs

Missclassified data vectors: 2/23 [or 8.7%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.253 1 0.522 0.5-0.5

50 0.000 18 0.012 0.0 0.0

100 0.000 13 0.006 0.0 0.0

150 0.000 7 0.010 0.0 0.0

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 8.74E-003

2 1.36E-022

> Missclassified f. vectors: 2/23 [or 8.7%]

> Fisher coefficient, F = 197.6

**Calcified area of PTCs**

Feature name: **F:** (Fisher)

---------------------------

Kurtosis 1.5556

S(0,4)Correlat 1.3738

Vertl\_LngREmph 1.2123

Skewness 1.0114

45dgr\_LngREmph 0.9689

135dr\_LngREmph 0.9364

S(5,5)AngScMom 0.9024

S(5,5)InvDfMom 0.8544

S(5,5)SumAverg 0.8508

S(5,-5)SumAverg 0.8309

\* b11 report file [PCA analysis] <2025-05-13 0:32:53>

\* Data file name: ""

\* Selected features [10 out of 10]

Kurtosis [#1/#1]; p.mean= 9.76242E+000, p.std= 1.21779E+001

S(0,4)Correlat [#2/#2]; p.mean=-1.16630E-001, p.std= 2.87660E-001

Vertl\_LngREmph [#3/#3]; p.mean= 3.60475E+001, p.std= 3.81275E+001

Skewness [#4/#4]; p.mean=-2.73995E+000, p.std= 1.80349E+000

45dgr\_LngREmph [#5/#5]; p.mean= 1.60563E+001, p.std= 1.36107E+001

135dr\_LngREmph [#6/#6]; p.mean= 1.58988E+001, p.std= 1.36663E+001

S(5,5)AngScMom [#7/#7]; p.mean= 4.26975E-001, p.std= 4.55362E-001

S(5,5)InvDfMom [#8/#8]; p.mean= 4.81888E-001, p.std= 4.79169E-001

S(5,5)SumAverg [#9/#9]; p.mean= 6.66601E+001, p.std= 6.52574E+001

S(5,-5)SumAverg [#10/#10]; p.mean= 6.63196E+001, p.std= 6.49474E+001

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

9.66411E+003

7.18547E+002

4.62665E+001

2.42170E+001

7.70001E-001

3.03802E-001

2.17411E-001

6.06422E-002

6.90351E-003

3.86271E-005

Linear dimensionality: 2

> Fisher coefficient, F = 0.9

> 1-NN classification of MEFs

Missclassified data vectors: 8/23 [or 34.78%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

5.50728E-001

2.09214E-013

1.33723E-014

1.09052E-015

1.24792E-016

3.17867E-017

-1.81007E-016

-7.90989E-016

-1.76298E-015

-2.65387E-014

Linear separability: 0.55

LDA dimensionality: 1

> Fisher coefficient, F = 5.1

> 1-NN classification of MDFs

Missclassified data vectors: 3/23 [or 13.04%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.245 2 0.451 0.5-0.4

50 0.146 10 0.001 0.0 0.0

100 0.281 15 0.185-0.2 0.2

150 0.278 17 0.193-0.2 0.2

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 2.68E-001

10 2.67E-001

13 2.67E-001

> Missclassified f. vectors: 2/23 [or 8.70%]

Sample No: 1; Category: 1; ClassResult: 2

Sample No: 2; Category: 1; ClassResult: 2

> Fisher coefficient, F = 7.9

Feature name: **P:** (POE+ACC)

---------------------------

Vertl\_Fraction 0.4027

S(0,4)Correlat 0.5652

Vertl\_LngREmph 0.5925

Variance 0.6572

Vertl\_ShrtREmp 0.7436

Vertl\_RLNonUni 0.7681

Vertl\_GLevNonU 0.7934

Variance 5.3138

Variance 5.3304

Vertl\_LngREmph 5.3343

\* Results [principal component analysis]

Eigenvalues of data covariance matrix:

9.66411E+003

7.18547E+002

4.62665E+001

2.42170E+001

7.70001E-001

3.03802E-001

2.17411E-001

6.06422E-002

6.90351E-003

3.86271E-005

Linear dimensionality: 3

> Fisher coefficient, F = 0.9

> 1-NN classification of MEFs

Missclassified data vectors: 8/23 [or 34.78%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

5.50728E-001

2.09214E-013

1.33723E-014

1.09052E-015

1.24792E-016

3.17867E-017

-1.81007E-016

-7.90989E-016

-1.76298E-015

-2.65387E-014

Linear separability: 0.55

LDA dimensionality: 1

> Fisher coefficient, F = 5.1

> 1-NN classification of MDFs

Missclassified data vectors: 2/23 [or 8.70%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.249 9 0.462 0.5-0.5

50 0.201 15 0.183-0.2 0.2

100 0.196 2 0.810 0.8-0.8

150 0.197 16 0.187-0.2 0.2

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 2.68E-001

10 2.67E-001

10 2.67E-001

> Missclassified f. vectors: 2/23 [or 8.70%]

Sample No: 1; Category: 1; ClassResult: 2

Sample No: 2; Category: 1; ClassResult: 2

> Fisher coefficient, F = 7.2

Feature name: **MI:**

---------------------------

S(1,-1)Correlat 0.3723

135dr\_LngREmph 0.3503

45dgr\_LngREmph 0.3503

Skewness 0.3216

S(0,2)Entropy 0.3207

Perc.10% 0.3102

Vertl\_LngREmph 0.3005

S(0,4)Correlat 0.2913

S(1,0)Contrast 0.2831

S(2,0)DifVarnc 0.2831

\* b11 report file [PCA analysis] <2025-05-13 0:22:48>

\* Data file name: ""

\* Selected features [10 out of 10]

S(1,-1)Correlat [#1/#1]; p.mean= 9.75656E-002, p.std= 3.20878E-001

135dr\_LngREmph [#2/#2]; p.mean= 1.58988E+001, p.std= 1.36663E+001

45dgr\_LngREmph [#3/#3]; p.mean= 1.60563E+001, p.std= 1.36107E+001

Skewness [#4/#4]; p.mean=-2.73995E+000, p.std= 1.80349E+000

S(0,2)Entropy [#5/#5]; p.mean= 4.01037E-001, p.std= 4.49033E-001

Perc.10% [#6/#6]; p.mean= 2.45043E+002, p.std= 1.77853E+001

Vertl\_LngREmph [#7/#7]; p.mean= 3.60475E+001, p.std= 3.81275E+001

S(0,4)Correlat [#8/#8]; p.mean=-1.16630E-001, p.std= 2.87660E-001

S(1,0)Contrast [#9/#9]; p.mean= 1.60530E+000, p.std= 3.06754E+000

S(2,0)DifVarnc [#10/#10]; p.mean= 1.50720E+000, p.std= 2.56077E+000

Feature vector standardized: NO

\* Results **[principal component analysis]**

Eigenvalues of data covariance matrix:

1.89791E+003

2.29499E+002

2.95562E+001

2.49062E+000

1.10320E+000

5.87642E-001

4.25962E-001

5.02591E-002

1.94122E-002

8.87894E-003

Linear dimensionality: 3

> Fisher coefficient, F = 1.0

> 1-NN classification of MEFs

Missclassified data vectors: 9/23 [or 39.13%]

\* Results **[linear discriminant analysis]**

Eigenvalues of [inv(Cw)\*Ct]:

7.56011E-001

1.33608E-014

1.03956E-015

3.39127E-016

1.44867E-016

1.09518E-017

-5.78492E-017

-1.61226E-016

-5.97638E-016

-1.63954E-015

Linear separability: 0.76

LDA dimensionality: 1

> Fisher coefficient, F = 13.0

> 1-NN classification of MDFs

Missclassified data vectors: 6/23 [or 26.08%]

\* Results **[nonlinear discriminant analysis]**

> Neural network architecture

input layer: 10 nodes

1st hidden layer: 1 neurons

2nd hidden layer: 2 neurons

output layer: 2 nodes

> backprop (eta=0.15, bpIterLimit=150000)

iter rms |-sample------------------------|

/1e3 error | # error dy1 dy2 |

0 0.250 15 0.548-0.5 0.6

50 0.001 17 0.014 0.0 0.0

100 0.000 5 0.004 0.0 0.0

150 0.000 3 0.014 0.0 0.0

> ANN weight numerical optimization

(optyIterLimit = 50; WeightCount = 21)

IterCount rms error

0 9.07E-003

3 2.99E-004

> Missclassified f. vectors: 1/23 [or 4.35%]

> Fisher coefficient, F = 39.2