NeuraMorph
Validation results

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Contents

Introduction

This document introduces the validation results of the NeuraMorph algorithm.

Validation has been performed by using NeuraMorph on data sets publicly available on Internet, and comparing the accuracy of prediction made by NeuraMorph with the publicly available results achieved by other algorithms.

To avoid "lucky strike", results introduced here are produced with an instance of the NeuraMorph model selected amongst models produced with a systematic exploration of hyper parameters of the model, and based on its average of prediction accuracy over 5 different random splits of training/test samples.

1 Breast Cancer Wisconsin (Diagnostic) Data Set

Source:
https://archive.ics.uci.edu/ml/datasets/Breast+Cancer+Wisconsin+(Diagnostic)

1.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	30/2
Nb samples	569
Percentage of training samples	90%
weakUnitThreshold	0.900000
precAcc	0.000010
depth	5
maxLvlDiv	1
nbMaxInputsUnit	2
nbMaxUnitDepth	21
order	2
pca	1
oneHot	1
allHot	0
Time training	16.4s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.000,0.000,0.000] 100.00% c.01 [0.000,0.000,0.000,0.000] 100.00% .... [0.000,0.000,0.000,0.000] 100.00%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.008,0.062,2.000] 99.61% c.01 [0.000,0.008,0.062,2.000] 99.61% .... [0.000,0.011,0.062,2.828] 99.61%

1.2 Concurrent results

1.2.1 Multisurface method

> "Dr. Wolberg [...] in collaboration with Prof. Mangasarian and two of his graduate students, Rudy Setiono and Kristin Bennett, [developped] a classifier [...] using the multisurface method (MSM) of pattern separation [...] that successfully diagnosed 97% of new cases."

Source:
http://pages.cs.wisc.edu/ olvi/uwmp/cancer.html

1.2.2 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 96.28%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

2 Iris Data Set

Source:
http://archive.ics.uci.edu/ml/datasets/Iris/

2.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	4/3
Nb samples	150
Percentage of training samples	90%
weakUnitThreshold	0.975000
precAcc	0.000010
depth	2
maxLvlDiv	1
nbMaxInputsUnit	2
nbMaxUnitDepth	11
order	1
pca	1
oneHot	1
allHot	0
Time training	0.0s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.000,0.000,0.000] 100.00% c.01 [0.000,0.000,0.000,0.000] 100.00% c.02 [0.000,0.000,0.000,0.000] 100.00% .... [0.000,0.000,0.000,0.000] 100.00%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.000,0.000,0.000] 100.00% c.01 [0.000,0.015,0.086,2.000] 99.26% c.02 [0.000,0.015,0.086,2.000] 99.26% .... [0.000,0.021,0.000,2.828] 99.26%

2.2 Concurrent results

2.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 94.67%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

2.2.2 Neural networks

> "Classification of Iris data set, Primoz Potocnik, Vitaly Borovinskiy"

Predictive accuracy:
Multilayer perceptron: 96.825% Radial basis function network: 96.825% Probabilistic neural network: 95.238%

Source:
http://lab.fs.uni-lj.si/lasin/wp/IMIT_files/neural/doc/seminar8.pdf

3 Annealing Data Set

Source:
https://archive.ics.uci.edu/ml/datasets/Annealing

3.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	77/5
Nb samples	798
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.000010
depth	4
maxLvlDiv	3
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	2
pca	1
oneHot	1
allHot	0
Time training	44.3s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.051,0.160,2.000] 97.47% c.01 [0.000,0.051,0.160,2.000] 97.47% c.02 [0.000,0.000,0.000,0.000] 100.00% c.03 [0.000,0.051,0.160,2.000] 97.47% c.04 [0.000,0.000,0.000,0.000] 100.00% .... [0.000,0.107,0.160,2.828] 96.20%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.028,0.118,2.000] 98.61% c.01 [0.000,0.022,0.106,2.000] 98.89% c.02 [0.000,0.003,0.037,2.000] 99.86% c.03 [0.000,0.003,0.037,2.000] 99.86% c.04 [0.000,0.000,0.000,0.000] 100.00% .... [0.000,0.039,0.118,2.828] 98.61%

3.2 Concurrent results

3.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 99.67%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

3.2.2 Rule based classifier

> "Analysis of Different Classification Algorithms Applied to Anneal Dataset Using Data Mining Techniques, V.Kamalakkannan, Dr.D. Ramyachitra, Computer Science Department, Bharathiar University, Coimbatore, Tamil Nadu, India"

Predictive accuracy:
Naive Bayes: 97.66%
SMO: 97.01%
OneR: 83.65%
J48: 95.88%

Source:
http://www.istpublications.com/temp/16_V_Kamalakkannan_Et_al_.pdf

4 Arrhythmia Data Set

Source:
https://archive.ics.uci.edu/ml/datasets/arrhythmia

4.1 NeuraMorph results

4.2 Concurrent results

4.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 74.12%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

4.2.2 Ensemble classifier, support vector machine and random forest with random sampling

> "Arrhythmia Disease Classification and Mobile Based System Design, Soha Samir AbdElMoneem, Hany Hanafy Said, and Amani Anwar Saad, Computer Engineering Department, Arab Academy for Science, Technology and Maritime Transport Abukir, Alexandria, Egypt"

Predictive accuracy: 98.18%
Source:
https://iopscience.iop.org/article/10.1088/1742-6596/1447/1/012014/pdf

4.2.3 Support vector machine

> "Multiclass Classification of Cardiac Arrhythmia Using Improved Feature Selection and SVM Invariants Anam Mustaqeem, Syed Muhammad Anwar, and Muahammad Majid, University of Engineering and Technology, Taxila, Pakistan"

Predictive accuracy: 92.07%
Source:
https://alendar.google.com/calendar/r/customday/2020/7/14?pli=1

5 Agaricus Lepiota Data Set

Source:
https://archive.ics.uci.edu/ml/datasets/mushroom

5.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	111/1
Nb samples	8124
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.000010
depth	6
maxLvlDiv	1
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	1
pca	0
oneHot	1
allHot	0
Time training	42.8s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.002,0.035,2.000] 99.88%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.002,0.031,2.000] 99.90%

5.2 Concurrent results

5.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 100.0%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

5.2.2 Decision tree

> "Agaricus Lepiota Analysis, Manikanda Prabhu M and Jerin Stanley Daniel J"

Predictive accuracy: 99.0%
Source:
https://rpubs.com/ManikandaPrabhuM/JerinDaniel-agaricuslepiota

6 Solar Flare Data Set

Source:
https://www.openml.org/data/get_csv/3597/dataset_116_solar-flare_2.arff

6.1 NeuraMorph results

6.1.1 Accuracy +/- 0.5

Training parameters:

Nb inputs/outputs	24/3
Nb samples	1066
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.500000
depth	2
maxLvlDiv	2
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	2
pca	1
oneHot	0
allHot	0
Time training	1.9s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.056,0.593,0.900,5.856] 75.47% c.01 [0.032,0.105,0.138,2.018] 94.34% c.02 [0.000,0.009,0.000,1.000] 99.06% .... [0.065,0.649,0.828,5.856] 89.62%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.031,0.392,0.461,6.940] 80.21% c.01 [0.000,0.073,0.177,5.018] 96.98% c.02 [0.000,0.004,0.000,0.751] 99.69% .... [0.065,0.422,0.500,6.940] 92.29%

6.1.2 Accuracy +/- 1.0

Training parameters:

Nb inputs/outputs	24/3
Nb samples	1066
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	1.000000
depth	2
maxLvlDiv	2
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	2
pca	1
oneHot	0
allHot	0
Time training	1.9s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.056,0.593,0.900,5.856] 87.74% c.01 [0.032,0.105,0.138,2.018] 98.11% c.02 [0.000,0.009,0.000,1.000] 99.06% .... [0.065,0.649,0.828,5.856] 94.97%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.031,0.392,0.461,6.940] 91.67% c.01 [0.000,0.073,0.177,5.018] 99.58% c.02 [0.000,0.004,0.000,0.751] 100.00% .... [0.065,0.422,0.500,6.940] 97.08%

6.2 Concurrent results

6.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 99.15%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

7 Abalone Data Set

Source:
http://archive.ics.uci.edu/ml/datasets/Abalone

7.1 NeuraMorph results

7.1.1 Accuracy +/- 0.5

Training parameters:

Nb inputs/outputs	10/1
Nb samples	4177
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.500000
depth	2
maxLvlDiv	0
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	1
pca	1
oneHot	0
allHot	0
Time training	0.2s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.004,1.488,1.155,12.157] 24.94%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.001,1.636,1.295,15.673] 23.24%

7.1.2 Accuracy +/- 1.0

Training parameters:

Nb inputs/outputs	10/1
Nb samples	4177
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	1.000000
depth	2
maxLvlDiv	0
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	1
pca	1
oneHot	0
allHot	0
Time training	0.2s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.004,1.488,1.155,12.157] 45.32%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.001,1.636,1.295,15.673] 42.45%

7.2 Concurrent results

7.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 26.45%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

7.2.2 Feed-forward supervised artificial neural networks

> "Extensions to the Cascade-Correlation architecture and benchmarking of feed-forward supervised artificial neural networks, Samuel George Waugh, BSc (Hons), Submitted in fulfilment of the requirements for the degree of Doctor of Philosophy, University of Tasmania, August, 1995"

Predictive accuracy: 26.25%
Source:
https://eprints.utas.edu.au/21965/1/whole$_W aughSamuelGeorge1997_t hesis.pdf$

8 Tic-Tac-Toe Data Set

Source:
https://archive.ics.uci.edu/ml/datasets/Tic-Tac-Toe+Endgame

8.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	9/1
Nb samples	958
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.000010
depth	7
maxLvlDiv	0
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	2
pca	1
oneHot	1
allHot	0
Time training	0.3s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.000,0.000,0.000] 100.00%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.007,0.059,2.000] 99.65%

8.2 Concurrent results

8.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 98.23%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

9 Pen Digits Data Set

Source:
https://archive.ics.uci.edu/ml/datasets/Pen-Based+Recognition+of+Handwritten+Digits

9.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	16/10
Nb samples	7494
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.000010
depth	4
maxLvlDiv	2
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	2
pca	1
oneHot	1
allHot	0
Time training	361.6s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.043,0.146,2.000] 97.86% c.01 [0.000,0.013,0.082,2.000] 99.33% c.02 [0.000,0.051,0.159,2.000] 97.46% c.03 [0.000,0.029,0.121,2.000] 98.53% c.04 [0.000,0.051,0.159,2.000] 97.46% c.05 [0.000,0.016,0.090,2.000] 99.20% c.06 [0.000,0.027,0.116,2.000] 98.66% c.07 [0.000,0.061,0.175,2.000] 96.93% c.08 [0.000,0.077,0.197,2.000] 96.13% c.09 [0.000,0.043,0.146,2.000] 97.86% .... [0.000,0.291,0.146,2.828] 89.72%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.013,0.082,2.000] 99.33% c.01 [0.000,0.001,0.024,2.000] 99.94% c.02 [0.000,0.016,0.089,2.000] 99.20% c.03 [0.000,0.017,0.092,2.000] 99.15% c.04 [0.000,0.021,0.103,2.000] 98.93% c.05 [0.000,0.003,0.037,2.000] 99.87% c.06 [0.000,0.006,0.054,2.000] 99.70% c.07 [0.000,0.023,0.108,2.000] 98.83% c.08 [0.000,0.038,0.137,2.000] 98.12% c.09 [0.000,0.006,0.056,2.000] 99.69% .... [0.000,0.102,0.082,2.828] 96.38%

9.2 Concurrent results

9.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 98.17%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

9.2.2 MLP

> "COMBINING MULTIPLE CLASSIFIERS FOR PEN-BASED HANDWRITTEN DIGIT RECOGNITION by Fevzi Alimoglu, B.S. in Computer Engineering, Bogazici University, 1994"

Predictive accuracy: 97.03%
Source:
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.25.6299rep=rep1type=pdf

10 Image Segmentation Data Set

Source:
http://archive.ics.uci.edu/ml/datasets/image+segmentation

10.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	18/7
Nb samples	2100
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.000010
depth	1
maxLvlDiv	3
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	2
pca	1
oneHot	1
allHot	0
Time training	5.9s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.029,0.120,2.000] 98.57% c.01 [0.000,0.076,0.196,2.000] 96.19% c.02 [0.000,0.038,0.138,2.000] 98.10% c.03 [0.000,0.095,0.219,2.000] 95.24% c.04 [0.000,0.000,0.000,0.000] 100.00% c.05 [0.000,0.133,0.259,2.000] 93.33% c.06 [0.000,0.010,0.069,2.000] 99.52% .... [0.000,0.269,0.120,2.828] 90.48%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.034,0.130,2.000] 98.31% c.01 [0.000,0.056,0.168,2.000] 97.20% c.02 [0.000,0.004,0.046,2.000] 99.79% c.03 [0.000,0.061,0.175,2.000] 96.93% c.04 [0.000,0.001,0.023,2.000] 99.95% c.05 [0.000,0.068,0.184,2.000] 96.61% c.06 [0.000,0.000,0.000,0.000] 100.00% .... [0.000,0.159,0.130,2.828] 94.39%

10.2 Concurrent results

10.2.1 Additive logistic regression

"J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 97.58%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

11 Dermatology Data Set

Source:
https://www.openml.org/d/35

11.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	34/6
Nb samples	358
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.000010
depth	1
maxLvlDiv	2
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	2
pca	1
oneHot	1
allHot	0
Time training	2.2s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.000,0.000,0.000] 100.00% c.01 [0.000,0.000,0.000,0.000] 100.00% c.02 [0.000,0.171,0.297,2.000] 91.43% c.03 [0.000,0.171,0.297,2.000] 91.43% c.04 [0.000,0.114,0.243,2.000] 94.29% c.05 [0.000,0.000,0.000,0.000] 100.00% .... [0.000,0.323,0.000,2.828] 88.57%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.025,0.111,2.000] 98.76% c.01 [0.000,0.000,0.000,0.000] 100.00% c.02 [0.000,0.074,0.193,2.000] 96.28% c.03 [0.000,0.056,0.167,2.000] 97.21% c.04 [0.000,0.012,0.079,2.000] 99.38% c.05 [0.000,0.006,0.056,2.000] 99.69% .... [0.000,0.123,0.111,2.828] 95.67%

11.2 Concurrent results

11.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 97.27%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

12 Page Blocks Data Set

Source:
https://www.openml.org/d/30

12.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	10/5
Nb samples	5473
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.000010
depth	1
maxLvlDiv	2
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	3
pca	1
oneHot	1
allHot	0
Time training	4.1s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.037,0.135,2.000] 98.17% c.01 [0.000,0.029,0.121,2.000] 98.54% c.02 [0.000,0.004,0.043,2.000] 99.82% c.03 [0.000,0.066,0.182,2.000] 96.71% c.04 [0.000,0.011,0.074,2.000] 99.45% .... [0.000,0.103,0.135,2.828] 96.34%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.028,0.118,2.000] 98.60% c.01 [0.000,0.017,0.093,2.000] 99.13% c.02 [0.000,0.005,0.051,2.000] 99.74% c.03 [0.000,0.052,0.161,2.000] 97.40% c.04 [0.000,0.005,0.051,2.000] 99.74% .... [0.000,0.076,0.118,2.828] 97.30%

12.2 Concurrent results

12.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 97.27%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

13 Balance Scale Data Set

Source:
http://archive.ics.uci.edu/ml/datasets/balance+scale

13.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	4/3
Nb samples	625
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.000010
depth	4
maxLvlDiv	3
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	1
pca	1
oneHot	1
allHot	0
Time training	0.6s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.129,0.256,2.000] 93.55% c.01 [0.000,0.032,0.128,2.000] 98.39% c.02 [0.000,0.161,0.286,2.000] 91.94% .... [0.000,0.228,0.256,2.828] 91.94%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.000,0.000,0.000] 100.00% c.01 [0.000,0.000,0.000,0.000] 100.00% c.02 [0.000,0.000,0.000,0.000] 100.00% .... [0.000,0.000,0.000,0.000] 100.00%

13.2 Concurrent results

13.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 96.48%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

14 Vote Data Set

Source:
https://www.openml.org/d/56

14.1 NeuraMorph results

Training parameters:

Nb inputs/outputs	48/1
Nb samples	435
Percentage of training samples	90%
weakUnitThreshold	0.800000
precAcc	0.000010
depth	1
maxLvlDiv	0
nbMaxInputsUnit	2
nbMaxUnitDepth	3
order	1
pca	1
oneHot	1
allHot	0
Time training	0.3s

Results:

Bias prediction (min/avg/sigma/max) and accuracy	c.00 [0.000,0.093,0.218,2.000] 95.35%
Bias training (min/avg/sigma/max) and accuracy	c.00 [0.000,0.087,0.209,2.000] 95.66%

14.2 Concurrent results

14.2.1 Additive logistic regression

> "J. Friedman, T. Hastie, R. Tibshirani (1998). Additive Logistic Regression: a Statistical View of Boosting. Stanford University."

Predictive accuracy: 95.86%
Source:
https://www.openml.org/f/77 https://projecteuclid.org/euclid.aos/1016218223

15

Source:
https://

15.1 NeuraMorph results

15.2 Concurrent results

15.2.1 Additive logistic regression

””

Source:
http://

15.3 Validation result

NeuraMorph performs as well as the concurrent algorithm(s) on this data set.