

Classifiers

Lecturer: Krzysztof Fajarewicz

Laboratory: Krzysztof Fajarewicz, Sebastian Student

Literature

Literature (primary)

1. Hastie T., Tibshirani R., Friedman J., The elements of statistical learning, Springer, 2009.
Electronic version: <https://web.stanford.edu/~hastie/ElemStatLearn/>
2. S. Theodoridis, K. Koutroumbas, (2003), Pattern recognition, Elsevier.
3. R. Duda, P. Hart, D. Stork, (2000), Pattern classification, Wiley.

Literature (secondary)

1. Haykin S.: Neural networks – a comprehensive foundation, Prentice Hall, 1993.
2. Bishop C. M.: Neural networks for pattern recognition, Oxford Univ. Press, 1998.
3. Goodfellow I., Bengio Y., Courville A., Deeplearning - współczesne systemy uczące się, PWN, 2018.
Electronic version: <http://www.deeplearningbook.org/>
4. Koronacki J., Ćwik J., Statystyczne systemy uczące się, EXIT, 2008.

Laboratory

- 8 Exercises
- Starts in the middle of April

<https://platforma.polsl.pl> – in preparation

Topics

Supervised classification

Classifiers

- Classical – statistics-based (Bayes, LDA, QDA, k-NN, ...)
- AI/ML-based (NN, SVM, genetic, evolutionary, ...)

Context of classification

- Data preprocessing
- Dimension reduction
 - Feature selection (filters, wrappers, embedded)
 - Feature extraction (PCA, ICA, PLS + nonlinear versions)
- Validation and testing
 - Different testing scenarios
 - Risk of "information leak"

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Unsupervised classification (clustering)

- k-means,
- Hierarchical clustering
- AI-based (SOM, Kohonen)
- Biclustering

...

Application of classifiers for different types of data

Credit conditions

Laboratory (8 exercises + reports)

+

Final test