Machine Learning

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Objectives

- understand and explain the basic concepts of machine learning
- understand formalized concepts and methods and be able to implement them in the form of algorithms
- sensibly select, adapt, and apply relevant methods
- being able to educate oneself

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Related Fields

- 1. Statistics [paradigms, models]
- 2. Mathematics
- 3. Information Retrieval [methods, algorithms]
- 4. Knowledge Processing
- 5. Heuristic Search
- 6. Decision Support Systems
- 7. Business Intelligence
- 8. Web Technology

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[applications]

Literature

Machine Learning:

- C.M. Bishop.
 Pattern Recognition and Machine Learning
 2nd edition, Springer 2007.
- □ L. Breiman, J.H. Friedman, R.A. Olshen, C.J. Stone. Classification and Regression Trees CRC Press reprint, 1998.
- □ N. Cristianini, J. Shawe-Taylor.
 An Introduction to Support Vector Machines and Other Kernel-based Learning Methods
 Cambridge University Press, 2000.
- □ T. Hastie, R. Tibshirani, J. Friedman.
 The Elements of Statistical Learning
 2nd edition, Springer, 2009. statweb.stanford.edu/~tibs/ElemStatLearn/
- □ T. Mitchell.

 Machine Learning

 1st edition, McGraw-Hill, 1997. www.cs.cmu.edu/~tom/mlbook.html*
- V. Vapnik.The Nature of Statistical Learning Theory2nd edition, Springer 2000.

Software

Programming:

□ Eclipse Foundation, Inc., Canada.
 Eclipse SDK
 Version 4.9. www.eclipse.org/downloads

Machine Learning:

- □ E. Frank, M. Hall, G. Holmes, M. Mayo, B. Pfahringer, T. Smith, I. Witten. Weka Machine Learning Project

 Version 3.8. www.cs.waikato.ac.nz/ml/weka
- □ scikit-learn: Machine Learning in Python Version 0.20 http://scikit-learn.org/stable/

Software

Statistics:

R Development Core Team.

R

Version 3.5. www.r-project.org

□ E. Jones, T. Oliphant, P. Peterson and others.

SciPy

Version 1.15. www.scipy.org

□ J.W. Eaton.

GNU Octave

Version 4.4. www.gnu.org/software/octave