

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

Related Fields

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

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 Theory
2nd 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