Machine Intelligence 1

0.1 Literature

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Textbooks for Machine Intelligence I

- Bertsekas: *Dynamic Programming and Optimal Control*, Vol. 1&2, Athena Scientific, 4rd Ed., 2012 & 2017*.
- Bishop: *Pattern Recognition and Machine Learning*, Springer-Verlag, 2006.
- Cowell, Dawid, Lauritzen & Spiegelhalter: *Probabilistic Networks and Expert Systems*, Springer Verlag, 1999*.
- Duda, Hart & Stock: *Pattern Classification*, Wiley, 2000.
- Goodfellow, Bengio & Courville: *Deep Learning*, MIT Press, 2016*.
- Haykin: *Neural Networks*, Prentice Hall, 1998.
- Jordan (Editor): *Learning in Graphical Models*, MIT Press, 1999*.
- Schölkopf & Smola: *Learning with Kernels*, MIT Press 2002.
- Sutton & Barto: *Reinforcement Learning: an Introduction*. MIT Press, 1998.
- Russel & Norvig: *Artificial Intelligence*, Prentice Hall, 2003, Chapters 13 und 14.
- Vapnik: *Statistical Learning Theory*, Wiley, 1998*.
- Wiering & van Otterlo (Editors): *Reinforcement Learning: State-of-the-Art*, Springer, 2012*.

* advanced readings

Advanced reading for MI1 chapters (1)

1. Artificial Neural Networks
   - 1.1 Introduction and General Comments: Haykin, Ch. 1
   - 1.2 Connectionist Neurons: Haykin, Chs. 1.3, 1.4
   - 1.3 Multilayer Perceptrons: Haykin, Ch. 4; Bishop, Chs. 5.1-5.5; Duda et al., Ch. 6.1-6.5
   - 1.4 Learning and Generalization: Haykin, Ch. 4; Bishop, Ch. 3.2; Duda et al., Ch. 6.8, 6.9
   - 1.5 Deep learning: Goodfellow et al., Chs. 7-9
   - 1.6 Recurrent networks: Haykin, Chs. 13-15; Goodfellow et al., Ch. 10;
   - 1.7 Radial Basis Function Networks: Haykin, Ch. 5
2. Learning Theory and Support Vector Machines
   - 2.1 Elements of Statistical Learning Theory: Haykin, Ch. 2.14; Schölkopf & Smola, Ch. 5
   - 2.2 Support Vector Machines: Haykin, Ch. 6; Bishop, Ch. 7.1; Schölkopf & Smola, Chs. 2, 7, 10.5, and - more advanced but useful - Ch. 13

Advanced reading for MI1 chapters (2)

3. Probabilistic Methods
   - 3.1 Bayesian Inference: Russel & Norvik, Ch. 13
   - 3.2 Graphical Models and Bayesian Networks: Bishop, Ch. 8; Russel & Norvik, Ch. 14, and - advanced but complete with all proofs - Cowell et al., Chs. 3-6
   - 3.3 Artificial Neural Networks and the Generative Model Approach: Bishop, Chs. 3.4, 3.5; Duda et al., Chs. 3.3-3.5

4. Reinforcement Learning
   - 4.1 Evaluation: Sutton & Barto, Chs. 3-7; Bertsekas, Vol 1; Haykin, Ch. 12
   - 4.2 Improvement: Sutton & Barto: Ch. 6.5; Haykin, Ch. 12
     Exploration: Sutton & Barto, Ch. 2; Wiering & van Otterlo: Ch 6
     Approximation: Sutton & Barto, Ch. 8; Bertsekas, Vol. 2, Ch. 6; Wiering & van Otterlo, Ch. 3