

"Introduction to Reinforcement Learning" (May 31st 2017)

Lecturer:

Dr. Michel Tokic, Siemens AG, Department: Corporate Technology / Learning Systems

Website: <http://www.tokic.com>

Mail: michel.tokic (at) siemens.com

Recommended Textbook:

R. Sutton and A. Barto: Reinforcement Learning: An Introduction. MIT Press, 1998.

HTML-Version of the textbook for free: <http://incompleteideas.net/sutton/book/the-book-1st.html>

Slides for the textbook: <http://webdocs.cs.ualberta.ca/~sutton/book/Slides/>

Open-Source RL-Toolbox:

<http://sourceforge.net/projects/teachingbox/>

RL-Mailinglist:

<https://groups.google.com/forum/#!forum/rl-list>

[rl-list] currently has > 2000 members worldwide!

Videos:

The Neuroscience of Reinforcement Learning: http://videlectures.net/icml09_niv_tnorl/

Thorndike - The Law of Effect: <http://www.youtube.com/watch?v=Vk6H7Ukp6To>

Towards Learning Robot Table Tennis: <https://www.youtube.com/watch?v=SH3bADiB7uQ>

Pigeon Solves Box-and-Banana-Problem: <http://www.youtube.com/watch?v=mDntbGRPeEU>

Randomized Ensemble Reinforcement Learning in Mario AI: <https://tokicblog.wordpress.com/super-mario-bros/>

Recommended literature:

G. Tesauro: **Programming backgammon using self-teaching neural nets**. *Artificial Intelligence* 134(1-2), 181-199 (2002).

N. J. van Eck and M. van Wezel. 2008. **Application of reinforcement learning to the game of Othello**. *Comput. Oper. Res.* 35, 6. 1999-2017.

T. Kietzmann and M. Riedmiller. **The Neuro Slot Car Racer: Reinforcement Learning in a Real World Setting**. *Proceedings of the Int. Conference on Machine Learning Applications (ICMLA09)*. Springer, Miami, Florida, Dec 2009.

V. Mnih, K. Kavukcuoglu, D. Silver, A. A. Rusu, J. Veness, M. G. Bellemare, A. Graves, M. Riedmiller, A. K. Fidjeland, G. Ostrovski, S. Petersen, C. Beattie, A. Sadik, I. Antonoglou, H. King, D. Kumaran, D. Wierstra, S. Legg, D. Hassabis. **Human-level control through deep reinforcement learning**. *Nature*, vol. 518, p 1529, 26 Feb. 2015. <http://www.nature.com/nature/journal/v518/n7540/full/nature14236.html>

M. Tokic, J. Fessler, and W. Ertel. **The crawler, a class room demonstrator for reinforcement learning**. In *Proceedings of the 22th International Florida Artificial Intelligence Research Society Conference FLAIRS'09*, pages 160-165, Menlo Park, California, USA, 2009. AAAI Press.

M. Tokic. **Reinforcement Learning: Psychologische und neurobiologische Aspekte**. *Künstliche Intelligenz*, 27(3):213-219, 2013.

D. Hein, S. Udluft, M. Tokic, A. Hentschel, T. Runkler, and V. Sterzing. **Batch Reinforcement Learning on the Industrial Benchmark: First Experiences**. In *Proceedings of the IEEE International Joint Conference on Neural Networks (IJCNN 2017)*. (to appear)