

# **Publications**

Dr Oliver Obst

22/06/14

# 1 Publications

## Journal papers

- [1] Oliver Obst. Distributed machine learning and sparse representations. *Neurocomputing*, 124:1, 2014.
- [2] Oliver Obst, Adrian Trinchi, Simon G. Hardin, Matthew Chadwick, Ivan Cole, Tim H. Muster, Nigel Hoschke, Diet Ostry, Don Price, Khoa N. Pham, and Tim Wark. Nano-scale reservoir computing. *Nano Communication Networks*, 4(4):189–196, 2013.
- [3] Oliver Obst. Distributed fault detection in sensor networks using a recurrent neural network. *Neural Processing Letters*, 2013.
- [4] Astrid Zeman, Oliver Obst, Kevin R. Brooks, and Anina N. Rich. The Müller-Lyer illusion in a computational model of biological object recognition. *PLoS ONE*, 8(2):e56126, February 2013.
- [5] Joschka Boedecker, Oliver Obst, Joseph T. Lizier, N. Michael Mayer, and Minoru Asada. Information processing in echo state networks at the edge of chaos. *Theory In Biosciences*, 131(3):205–213, September 2012.
- [6] Mikhail Prokopenko, Joseph T. Lizier, Oliver Obst, and X. Rosalind Wang. Relating fisher information to order parameters. *Physical Review E*, 84(4):041116, 2011.
- [7] Mikhail Prokopenko, Nihat Ay, Oliver Obst, and Daniel Polani. Phase transitions in least-effort communications. *Journal of Statistical Mechanics: Theory and Experiment*, 2010(11):P11025, 2010.
- [8] Joschka Boedecker, Oliver Obst, Norbert Michael Mayer, and Minoru Asada. Initialization and self-organized optimization of recurrent neural network connectivity. *HFSP Journal*, 3(5):340–349, October 2009.
- [9] Oliver Obst and Markus Rollmann. SPARK – A Generic Simulator for Physical Multiagent Simulations. *Computer Systems Science and Engineering*, 20(5):347–356, September 2005.
- [10] Pedro Lima, Luís Custódio, Levent Akin, Adam Jacoff, Gerhard Kraezschmar, Beng Kiat Ng, Oliver Obst, Thomas Röfer, Yasutake Takahashi, and Changjiu Zhou. RoboCup 2004 competitions and symposium: A small kick for robots, a giant score for science. *AI Magazine*, 26(2):36–61, Summer 2005.
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- [12] Ulrich Furbach, Oliver Obst, and Frieder Stolzenburg. Intelligente Agenten und KI. *LOG IN – Informatische Bildung und Computer in der Schule*, 20(3/4):17–21, 2000.
- [13] Oliver Obst. RoboCup: FC-Linux - Mit Linux zur Fußball-WM. *Linux-Magazin*, (8):48–51, 1998.

## Books and Manuals

- [14] Oliver Obst. *Controlling Physical Multiagent Teams: Getting League-Independent Results from RoboCup Soccer*. Number 304 in DISKI – Dissertations in Artificial Intelligence. Aka / IOS Press, 2007. ISBN 978-1-58603-705-5.
- [15] Mao Chen, Ehsan Foroughi, Fredrik Heintz, ZhanXiang Huang, Spiros Kapetanakis, Kostas Kostiadis, Johan Kummeneje, Itsuki Noda, Oliver Obst, Patrick Riley, Timo Steffens, Yi Wang, and Xiang Yin. *RoboCup Soccer Server*. The RoboCup Federation, for soccer server version 7.07 and later edition, 2003. Published online.
- [16] Oliver Obst. *RoboLog – An ECLiPSe-Prolog SoccerServer Interface: Users Manual*, March 1998. Published online.

## Book chapters

- [17] Oliver Obst and Joschka Boedecker. *Guided Self-Organization: Inception*, volume 9 of *Emergence, Complexity and Computation*, chapter Guided Self-Organization of Input-Driven Recurrent Neural Networks, pages 319–340. Springer, Berlin, Heidelberg, 2014.
- [18] Raja Jurdak, X. Rosalind Wang, Oliver Obst, and Philip Valencia. *Wireless Sensor Network Anomalies: Diagnosis and Detection Strategies*, volume 10 of *Intelligent Systems Reference Library*, chapter 12, pages 309–325. Springer, Berlin, Heidelberg, 2011.
- [19] Heni Ben Amor, Jan Murray, and Oliver Obst. *AI Game Programming Wisdom 3*, chapter Fast, Neat and Under Control: Inverse Steering Behaviors for Physical Autonomous Agents, pages 221–232. Charles River Media, Boston, MA, 2006. ISBN 1-58450-457-9.
- [20] Frank Dylla, Alexander Ferrein, Gerhard Lakemeyer, Jan Murray, Oliver Obst, Thomas Röfer, Stefan Schiffer, Frieder Stolzenburg, Ubbo Visser, and Thomas Wagner. *Computers in Sport*, chapter Approaching a Formal Soccer Theory from the Behavior Specification in Robotic Soccer, pages 161–186. Bioengineering. WIT Press, 2008. ISBN 978-1-84564-064-4.
- [21] Oliver Obst and Daniel Polani. Simulation league – league summary. In Gal A. Kaminka, Pedro U. Lima, and Raul Rojas, editors, *RoboCup 2002: Robot Soccer World Cup VI*, volume 2752 of *Lecture Notes in Artificial Intelligence*, pages 443–452. Springer, 2003.

## Refereed conference papers

- [22] David Budden, Peter Wang, Oliver Obst, and Mikhail Prokopenko. Simulation leagues: Analysis of competition formats. In *RoboCup 2014: Robot Soccer World Cup XVIII*, 2014.
- [23] Oliver M. Cliff, Joseph T. Lizier, X. Rosalind Wang, Peter Wang, Oliver Obst, and Mikhail Prokopenko. Towards quantifying interaction networks in a football match. In *Proceedings of the RoboCup 2013 Symposium*, 2013.
- [24] Oliver Obst and Martin Riedmiller. Taming the reservoir: Feedforward training for recurrent neural networks. In *The International Joint Conference on Neural Networks (IJCNN 2012)*, pages 1–7. IEEE, 2012.
- [25] Christoph Hartmann, Joschka Boedecker, Oliver Obst, Shuhei Ikemoto, and Minoru Asada. Real-time inverse dynamics learning for musculoskeletal robots based on echo state gaussian process regression. In *Robotics: Science and Systems (RSS 2012)*, 2012.
- [26] Oliver Obst, Daniel Polani, and Mikhail Prokopenko. Origins of scaling in genetic code. In George Kampis, István Karsai, and Eörs Szathmáry, editors, *Advances in Artificial Life. Darwin Meets von Neumann*, volume 5778 of *Lecture Notes in Computer Science*, pages 85–93. Springer, Berlin / Heidelberg, 2011.
- [27] Oliver Obst, Joschka Boedecker, and Minoru Asada. Improving recurrent neural network performance using transfer entropy. In Kok Wai Wong, B. Sumudu U. Mendis, and Abdesselam Bouzerdoum, editors, *Neural Information Processing. Models and Applications*, volume 6444 of *Lecture Notes in Computer Science*, pages 193–200. Springer, 2010.
- [28] N. Michael Mayer, Oliver Obst, and Chang Yu-Chen. Time series causality inference using echo state networks. In Vincent Vigneron, Vicente Zarzoso, Eric Moreau, Rémi Gribonval, and Emmanuel Vincent, editors, *Ninth International Conference on Latent Variable Analysis and Signal Separation*, volume 6365 of *Lecture Notes in Computer Science*, pages 279–286. Springer, Berlin, Heidelberg, 2010.
- [29] Oliver Obst. Distributed fault detection using a recurrent neural network. In *Proceedings of the International Conference on Information Processing in Sensor Networks (IPSN 2009)*, pages 373–374. IEEE Computer Society, April 2009.
- [30] Joschka Boedecker, Oliver Obst, Norbert Michael Mayer, and Minoru Asada. Studies on reservoir initialization and dynamics shaping in echo state networks. In Michel Verleysen, editor, *Proceedings of the 17th European Symposium On Artificial Neural Networks (ESANN'09)*, pages 227–232, Evere, Belgium, April 2009. D-Side Publications.

- [31] Oliver Obst, X. Rosalind Wang, and Mikhail Prokopenko. Using echo state networks for anomaly detection in underground coal mines. In *Proceedings of the International Conference on Information Processing in Sensor Networks (IPSN 2008)*, pages 219–229. IEEE Computer Society, April 2008.
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- [33] Norbert Michael Mayer, Joschka Boedecker, Rodrigo da Silva Guerra, Oliver Obst, and Minoru Asada. 3D2Real: Simulation league finals in real robots. In Gerhard Lakemeyer, Elizabeth Sklar, Domenico G. Sorrenti, and Tomoichi Takahashi, editors, *RoboCup 2006: Robot Soccer World Cup X*, volume 4434 of *Lecture Notes in Artificial Intelligence*, pages 25–34, Berlin, Heidelberg, 2007. Springer.
- [34] Oliver Obst and Joschka Boedecker. Flexible coordination of multiagent team behavior using HTN planning. In Itsuki Noda, Adam Jacoff, Ansgar Bredendfeld, and Yasutake Takahashi, editors, *RoboCup 2005: Robot Soccer World Cup IX*, Lecture Notes in Artificial Intelligence, pages 521–528. Springer, Berlin, Heidelberg, New York, 2006.
- [35] Frank Dylla, Alexander Ferrein, Gerhardt Lakemeyer, Jan Murray, Oliver Obst, Thomas Röfer, Frieder Stolzenburg, Ubbo Visser, and Thomas Wagner. Towards a League-Independent Qualitative Soccer Theory for RoboCup. In Daniele Nardi, Martin Riedmiller, Claude Sammut, and José Santos-Victor, editors, *RoboCup 2004: Robot Soccer World Cup VIII*, volume 3276 of *Lecture Notes in Artificial Intelligence*, pages 611–618. Springer, Berlin, Heidelberg, New York, 2005.
- [36] Oliver Obst and Markus Rollmann. SPARK – A Generic Simulator for Physical Multiagent Simulations. In Gabriela Lindemann, Jörg Denzinger, Ingo J. Timm, and Rainer Unland, editors, *Multiagent System Technologies – Proceedings of the MATES 2004*, volume 3187 of *Lecture Notes in Artificial Intelligence*, pages 243–257. Springer, September 2004.
- [37] Oliver Obst. Using model-based diagnosis to build hypotheses about spatial environments. In Daniel Polani, Andrea Bonarini, Brett Browning, and Kazuo Yoshida, editors, *RoboCup 2003: Robot Soccer World Cup VII*, Lecture Notes in Artificial Intelligence, pages 518 – 525. Springer, Berlin, Heidelberg, New York, 2004.
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- [39] Frieder Stolzenburg, Oliver Obst, and Jan Murray. Qualitative velocity and ball interception. In Matthias Jarke, Jana Köhler, and Gerhard Lakemeyer, editors, *KI-2002: Advances in Artificial Intelligence – Proceedings of the 25th Annual German Conference on Artificial Intelligence*, number 2479 in Lecture Notes in Artificial Intelligence, pages 283–298, Berlin, Heidelberg, New York, 2002. Springer.
- [40] Oliver Obst. Specifying rational agents with statecharts and utility functions. In Andreas Birk, Silvia Coradeschi, and Satoshi Tadokoro, editors, *RoboCup-01: Robot Soccer WorldCup V*, number 2377 in Lecture Notes in Artificial Intelligence, pages 173–182. Springer, Berlin, Heidelberg, New York, 2002.
- [41] Jan Murray, Oliver Obst, and Frieder Stolzenburg. Towards a logical approach for soccer agents engineering. In Peter Stone, Tucker Balch, and Gerhard Kraetzschmar, editors, *RoboCup-2000: Robot Soccer World Cup IV*, number 2019 in Lecture Notes in Artificial Intelligence, pages 199–208. Springer, Berlin, Heidelberg, New York, 2001.
- [42] Frieder Stolzenburg, Oliver Obst, Jan Murray, and Björn Bremer. Spatial agents implemented in a logical expressible language. In Manuela Veloso, Enrico Pagello, and Hiroaki Kitano, editors, *RoboCup-99: Robot Soccer World Cup III*, volume 1856 of *Lecture Notes in Artificial Intelligence*. Springer, 2000.

### Refereed workshop papers

- [43] Oliver Obst, Adrian Trinchi, Simon G. Hardin, Matthew Chadwick, Ivan Cole, Tim H. Muster, Nigel Hoschke, Diet Ostry, Don Price, Khoa N. Pham, and Tim Wark. Nano-scale reservoir computing. In *Proceedings of the 3rd IEEE International Workshop on Molecular and Nanoscale Communications (IEEE MoNaCom 2013)*, 2013.
- [44] Oliver Obst. Distributed backpropagation-decorrelation learning. In *NIPS Workshop: Large-Scale Machine Learning: Parallelism and Massive Datasets*, 2009.
- [45] Michael Quinlan, Oliver Obst, and Stephan Chalup. Towards autonomous strategy decisions in the RoboCup four-legged league. In *Proceedings of the Seventh IJCAI International Workshop on Nonmonotonic Reasoning, Action and Change*, 2007.
- [46] Oliver Obst. Using a planner for coordination of multiagent team behavior. In Rafael H. Bordini, Mehdi Dastani, Jürgen Dix, and Amal ElFallah Seghrouchni, editors, *Programming Multi-Agent Systems: Third International Workshop, ProMAS 2005, Utrecht, The Netherlands, July 26, 2005, Revised and Invited Papers*, volume 3862 of *Lecture Notes in Computer Science*, pages 90 – 100. Springer, Berlin, March 2006.
- [47] Jan Murray, Frieder Stolzenburg, Oliver Obst, and Björn Bremer. RoboLog Koblenz: Complex agent scripts implemented in logic. In Stefan Sablatnög and

Stefan Enderle, editors, *Proceedings of the Workshop RoboCup during KI'99 in Bonn*, pages 12–25, 1999. SFB 527 Report 1999/12, Universität Ulm.

- [48] Oliver Obst, Jan Murray, Frieder Stolzenburg, and Björn Bremer. Towards deduction in RoboCup. In *Proceedings of the RoboCup Workshop during KI'98*, Bremen, 1998.
- [49] Frieder Stolzenburg and Oliver Obst. Reasoning with constraints and well-founded negation. In *Documents of the ERCIM/Compulog Workshop on Constraints*, Schloß Hagenberg, Linz, 1997.

## Theses

- [50] Oliver Obst. *Controlling Physical Multiagent Teams: Getting League-Independent Results from RoboCup Soccer*. PhD thesis, Universität Koblenz, 2006.
- [51] Oliver Obst. RoboLog: Eine deduktive Schnittstelle zum RoboCup Soccer Server. Master's thesis, Universität Koblenz, February 1999.

## Patents

- [52] Oliver Obst. Construction and training of a recurrent neural network. Patent application WO/2010/144947, June 2009.

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- [53] Oliver Obst, Joschka Boedecker, Andreea Lazar, and Astrid Zeman. Effects of plasticity on information dynamics in a recurrent neural network. In *NeuroEng 2014*, 2014.
- [54] Astrid Zeman, Kevin R. Brooks, and Oliver Obst. Underlying causes and generalisability of geometrical illusions within HMAX. Poster at the 40th Australasian Experimental Psychology Conference (EPC 2013), 2013.
- [55] Astrid Zeman, Kevin R. Brooks, and Oliver Obst. Hierarchical feature representation reduces the Müller-Lyer effect. 36th European Conference on Visual Perception, Bremen, Germany; Perception 42 ECVF Abstract Supplement p 223.
- [56] Oliver Obst, Joschka Boedecker, Benedikt Schmidt, and Minoru Asada. Computing information storage for input-driven systems. 6th Australian Workshop on Computational Neuroscience, NeuroEng 2013.
- [57] Astrid Zeman, Oliver Obst, and Anina N. Rich. Reproducing the Müller-Lyer Illusion in a Computational Feed-forward Object Recognition Model. Peer-Reviewed Presentations at the Australasian Cognitive Neurosciences Conference (21st meeting of the Australasian Society for Psychophysiology), December 9-12, 2011, Macquarie University, Sydney, Australia. Published in *Clin EEG Neurosci* July 2012 43: 215–250.

- [58] Astrid Zeman, Oliver Obst, and Anina N. Rich. Exploring the Müller-Lyer illusion using an artificial feed-forward object recognition model. *Perception*, 40 ECVF Abstract Supplement:201, August 2011.

### Technical reports

- [59] Oliver Obst, Joschka Boedecker, Benedikt Schmidt, and Minoru Asada. On active information storage in input-driven systems. arXiv preprint 1303.5526v1, arXiv.org, 2013. Also published as a poster at the 6th Australian Workshop on Computational Neuroscience, 2013.
- [60] X. Rosalind Wang, Oliver Obst, and Mikhail Prokopenko. Smart Grids: Priority Areas Analysis. CSIRO Technical Report EP092553, 2010, 59 pages.
- [61] Oliver Obst. Gas-Liquid Cyclone Separators — Modelling and Automatic Control. CSIRO Technical Report EP092321, 2009, 30 pages.
- [62] Oliver Obst and Markus Rollmann. Spark — A Generic Simulator for Physical Multi-agent Simulations. Fachberichte Informatik 7–2004, Universität Koblenz-Landau, Universität Koblenz-Landau, Institut für Informatik, Rheinau 1, D-56075 Koblenz, 2004.
- [63] Heni Ben Amor, Oliver Obst, and Jan Murray. Fast, neat and under control: Inverse steering behaviors for physical autonomous agents. Fachberichte Informatik 12–2003, Universität Koblenz-Landau, Universität Koblenz-Landau, Institut für Informatik, Rheinau 1, D-56075 Koblenz, 2003.
- [64] Oliver Obst. Using Model-Based Diagnosis to Build Hypotheses about Spatial Environments. Fachberichte Informatik 5–2003, Universität Koblenz-Landau, Universität Koblenz-Landau, Institut für Informatik, Rheinau 1, D-56075 Koblenz, 2003.
- [65] Marco Kögler and Oliver Obst. Simulation League: The Next Generation. Fachberichte Informatik 3–2003, Universität Koblenz-Landau, Universität Koblenz-Landau, Institut für Informatik, Rheinau 1, D-56075 Koblenz, 2003.
- [66] Frieder Stolzenburg, Oliver Obst, and Jan Murray. Qualitative Velocity and Ball Interception. Fachberichte Informatik 4–2002, Universität Koblenz-Landau, Universität Koblenz-Landau, Institut für Informatik, Rheinau 1, D-56075 Koblenz, 2002.
- [67] Oliver Obst. Specifying Rational Agents with Statecharts and Utility Functions. Fachberichte Informatik 5–2001, Universität Koblenz-Landau, Universität Koblenz-Landau, Institut für Informatik, Rheinau 1, D-56075 Koblenz, 2001.



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### Other publications

- [70] Mikhail Prokopenko, Peter Wang, and Oliver Obst. Gliders2014: Dynamic Tactics with Voronoi Diagrams. RoboCup 2014 team description paper, 2014.
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