

Alexander Dockhorn | Curriculum Vitae

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Research

Forward Model Learning

PhD Student

Magdeburg

2016–2019

Part of my PhD project focuses on developing a process of modelling environment dynamics by observation. This would enable the application of statistical forward planning methods, which proved to be successful in a wide range of game playing scenarios. While my previous studies focused on the applications to general game learning similar methods could be used in the context of robotics and optimisation.

Game State Induction

PhD Student

Magdeburg

2016–2019

In the second part of my PhD project I analyse how statistical forward planning methods can be applied to partial information games. New techniques for inducing the current state are analysed and compared to the state-of-the-art. Applications such as collectable card games present a natural benchmark and lead me to the creation of an international research competition on Hearthstone AI.

Optimisation of Density-Based Cluster Algorithms

Student Research Assistant

Magdeburg

2014–2015

Prior to my work as a PhD student I focused on generalisations of density-based clustering methods. My work resulted in multiple conference papers in which I proposed new techniques for hierarchical density-based clustering, parameter optimisation, and cluster validation.

Social Network Analysis

Student Research Assistant

Magdeburg

2012–2014

During my undergraduate degree I assisted in multiple research projects on social network analysis, in which we developed benchmarks for dynamic graph clustering. Based on these we analysed the applicability of various graph clustering approaches regarding the graphs inherent properties.

Selected Publications

Alexander Dockhorn and Daan Apeldoorn. Forward Model Approximation for General Video Game Learning. In *Proceedings of the 2018 IEEE Conference on Computational Intelligence and Games (CIG'18)*, pages 425–432. IEEE, 2018.

Alexander Dockhorn, Max Frick, Ünal Akkaya, and Rudolf Kruse. Predicting Opponent Moves for Improving Hearthstone AI. In Jesús Medina, Manuel Ojeda-Aciego, José Luis Verdegay, David A. Pelta, Inma P. Cabrera, Bernadette Bouchon-Meunier, and Ronald R. Yager, editors, *17th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems, IPMU 2018*, pages 621–632. Springer International Publishing, 2018.

Alexander Dockhorn, Tim Tippelt, and Rudolf Kruse. Model Decomposition for Forward Model Approximation. In *2018 IEEE Symposium Series on Computational Intelligence (SSCI)*, pages 1751–1757, 2018.

Education

Academic Qualifications.....

Otto von Guericke University <i>M.Sc. Computer Science</i>	Magdeburg 2014–2015
University of Abertay <i>Semester abroad</i>	Dundee 2012–2013
Otto von Guericke University <i>B.Sc. Computer Science</i>	Magdeburg 2010–2014

Teaching Activities.....

Appointed Lecturer of the <i>Computational Intelligence</i> working group <i>Computational Intelligence in Games,</i>	Magdeburg 2018
Teaching Assistant of the <i>Computational Intelligence</i> working group, M.Sc. <i>Bayes Networks, Classification Algorithms, Computational Intelligence in Games</i>	Magdeburg 2016–2018
Teaching Assistant of the <i>Computational Intelligence</i> working group, B.Sc. <i>Neural Networks, Intelligent Data Analysis, Intelligent Systems</i>	Magdeburg 2014–2015

Technical skills.....

- **Programming Languages:** Proficient in: C#, Java, Python, R
- **Software Skills:** L^AT_EX, Matlab, KNIME, Unity (game engine), Office applications

Notable Projects

- **International Research Competition: 'Hearthstone AI'**

I am the organiser of the international research competition on Hearthstone AI, which was part of the IEEE Conference on Computational Intelligence and Games 2018. The competition focuses on the development of autonomous Hearthstone agents and tested the agent's skill on multiple game playing tasks. It attracted a total of 50 submissions and was the largest competition of the conference. Due to numerous requests, it will be held again at the IEEE Conference on Games 2019.

Awards and Honours

- **Best Presentation Award** at Doctoral Symposium in 2018/2019
- **Best Computer Science Master Graduate** in 2015/2016
- **Teaching award "Held der Lehre"** from the department of computer science