Alexander Dockhorn | Curriculum Vitae

University of Southern Denmark, SDU Metaverse Lab
Campusvej 55, 5230 Odense, Denmark

adoc@mmmi.sdu.dk
https://gdlt.sdu.dk/alexander-dockhorn/

Education

Otto von Guericke University — **Magdeburg**
PhD, Final Grade: Summa Cum Laude — *2016–2020*

Otto von Guericke University — **Magdeburg**
M.Sc. Computer Science, Final Grade: 1.0 — *2014–2015*

University of Abertay — **Dundee**
Term abroad — *2012–2013*

Otto von Guericke University — **Magdeburg**
B.Sc. Computer Science, Final Grade: 1.2 — *2010–2014*

Working Experience

University of Southern Denmark, SDU Metaverse Lab — **Odense**
Associate Professor — *2025–ongoing*
- Artificial Intelligence
- Applications in Health, Robotics, and Serious Games

Leibniz University Hannover, Institute for Information Processing — **Hannover**
Juniorprofessor — *2022–2025*
- Learning Abstractions for Complex Domains
- Explainable Machine Learning and Causality

Otto von Guericke University Magdeburg — **Magdeburg**
Postdoctoral Research Associate — *2021–2022*
- Multi-Objective Optimization and Decision-Making
- Bayesian Networks

Queen Mary University of London, Game AI Research Group — **London**
Postdoctoral Research Associate — *2020–2021*
- Decision-making in Exponentially Growing Decision Spaces
- State and Action Abstractions for Evolutionary Search Algorithms

Otto von Guericke University Magdeburg, University Bremen and Salzgitter AG — **Salzgitter**
Research Project — *2019*
- Time Series Analysis
- Forecasting Demand

Otto von Guericke University Magdeburg, Faculty Computer Science, CI Group, Supervisor Prof. Dr. Rudolf Kruse — **Magdeburg**
PhD Student, Research and Teaching Associate — *2016-2019*

ISC Gebhardt **Wolfsburg**
Working Student *2014*
- Forecasting Demand
- Bayesian Modeling

SAP Innovation Center **Potsdam**
Bachelor Internship *2013–2014*
- Medical Data Analysis for Cancer Treatment
- Bayesian Modeling

British Telecom Research **Ipswich**
Research Internship *2013*
- Frequent Item Set Mining
- Correlation and Causation Analysis

Publications

Total Number of Publications: 71, **Number of Peer-reviewed Publications: 65**
Number of First Authorships: 30, **Number of Corresponding Authorships: 32**
h-Index: 15, **i10-Index: 22,** **Total Citations: 918** (According to Google Scholar, 01/13/2026)

Bookchapters (6)

Borgelt, C., **Dockhorn, A.**, & Kruse, R. (2026). "9 Unsicheres und unscharfes Wissen". Handbuch der Künstlichen Intelligenz, edited by Tanya Braun, Eyke Hüllermeier, Ute Schmid and Günther Görz, De Gruyter Oldenbourg, 2026, pp. 247-288.

Dockhorn, A., & Kruse, R. (2025). An Overview of Reinforcement Learning Algorithms for Causal Discovery. In N. Daras, A. Fytopoulos, P. Pardalos (Eds.), Handbook of Artificial Intelligence and Machine Learning in Decision Making (to be published), Springer

Dockhorn, A., & Kruse, R. (2023). State and Action Abstraction for Search and Reinforcement Learning Algorithms. In Y. P. Kondratenko, V. Kreinovich, W. Pedrycz, A. A. Chikrii, A. M. Gil Lafuente (Eds.), Artificial Intelligence in Control and Decision-making Systems. Springer.

Dockhorn, A.. (2021). Vorhersagebasierte Suche für autonomes Spielen. In: Hölldobler, S. (Hrsg.), Ausgezeichnete Informatikdissertationen 2020. Bonn: Gesellschaft für Informatik e.V.. (pp. 69-78).

Dockhorn, A., & Kruse, R. (2021). Balancing Exploration And Exploitation in Forward Model Learning. In V. Sgurev, V. Jotsov and J. Kacprzyk (Eds.), Advances in Intelligent Systems Research and Innovation. Elsevier.

Dockhorn, A., Saxton, C., & Kruse, R. (2020). Association Rule Mining for Unknown Video Games. In M.-J. Lesot and C. Marsala and (Eds.), Fuzzy Approaches for Soft Computing and Approximate Reasoning: Theories and Applications, (pp. 257-270). Studies in Fuzziness and Soft Computing, Springer Cham.

Journal Papers (13)

Eberhardinger, M., Goodman, J., **Dockhorn, A.**, Perez-Liebana, D., Gaina, R. D. Gaina, Cakmak, D., Maghsudi, S., & Lucas, S.. From Code to Play: Benchmarking Program Search for Games Using Large Language Models, *IEEE Transactions on Games* (to be published)

Schmöcker, R., and **Dockhorn, A.** (2025). Cascade - A sequential ensemble method for continuous control tasks, *Reinforcement Learning Journal*, (pp. 399-411).

Yang, C.-H., Liao, Y.-S., Huang, C.-R., and **Dockhorn, A.** (2025). Explaining Neural Style Transfer, *IEEE*

Access, (pp. 1-2).

Schmöcker, R., **Dockhorn, A.** (2025). A survey of non-learning-based abstractions for sequential decision-making, *IEEE Access*, (pp. 1-16).

Mittenentzwei, S., Garrison, L., Budich, B., Lawonn, K., **Dockhorn, A.**, Preim, B., Meuschke, M. (2025). AI-based character generation for disease stories: A case study using epidemiological data to highlight preventable risk factors, *i-com*.

Xu, L., **Dockhorn, A.** & Perez-Liebana, D. (2023). Elastic Monte Carlo Tree Search, *IEEE Transactions on Games*, vol. 15, no. 4, (pp. 527-537).

Dockhorn, A., & Lucas, S. (2022). Choosing Representation, Mutation, and Crossover in Genetic Algorithms, *IEEE Computational Intelligence Magazine*, (pp. 1-2).

Dockhorn, A., Kirst, M., Mostaghim, S., Wieczorek, M., & Zille H. (2022). Evolutionary Algorithm for Parameter Optimization of Context Steering Agents, *IEEE Transactions on Games*, (pp. 1-10).

Dockhorn, A., & Kruse, R. (2021). Modellheuristiken für effizientes Forward Model Learning. *at - Automatisierungstechnik*, vol. 69, no. 10, (pp. 848-857).

Dockhorn, A., & Kruse, R. (2021). Fuzzy Modeling in Game AI. *TWMS Journal of Pure and Applied Mathematics*, vol. 12, no. 1, (pp.54-68).

Apeldoorn, D., & **Dockhorn, A.** (2021). Exception-Tolerant Hierarchical Knowledge Bases for Forward Model Learning. *IEEE Transactions on Games*, (pp. 1-14).

Dockhorn, A., & Kruse, R. (2020). Predicting Cards Using a Fuzzy Multiset Clustering of Decks. *International Journal of Computational Intelligence Systems*, 13(1), (pp. 1207-1217). Atlantis Press

Held, P., **Dockhorn, A.**, & Kruse, R. (2015). On Merging and Dividing Social Graphs. *Journal of Artificial Intelligence and Soft Computing Research*, 5(1), (pp. 23–49).

Conference Papers (41)

Melhart, D., **Dockhorn, A.**, and Drachen, A. (2026). AURA: Automated Analysis and Reporting of Therapeutically Applied Table-top Role-Playing Games, *FDG '26: Proceedings of the 21th International Conference on the Foundations of Digital Games*, ACM (to be published)

Gerbeaud, A., Lorcet, L., Campan, L., **Dockhorn, A.**, Wolf, F., Lherbier, A., and Addoum, M. (2026). Large Language Models for Behavior Tree Generation in Unreal Engine, *FDG '26: Proceedings of the 21th International Conference on the Foundations of Digital Games*, ACM (to be published)

Schmöcker, R., **Dockhorn, A.**, Rosenhahn, B. (2026). Grouping Nodes with known Value Differences: A lossless UCT-based Abstraction Algorithm, *14th International Conference on Learning Representations*, (to be published)

Schmöcker, R., **Dockhorn, A.**, Rosenhahn, B. (2026). AUPO - Abstracted until proven otherwise: A reward distribution based abstraction algorithm, *Proceedings of the Thirty-Sixth International Conference on Automated Planning and Scheduling*, AAAI, (to be published)

Droste, J., Fuchs, R., Deters, H., Obaidi, M., **Dockhorn, A.**, Schneider, K. (2026). Immersive and Enjoyable Explanations - On Distinct Explainability Requirements in Games, *Requirements Engineering: Foundation for Software Quality, 32nd International Working Conference*, Springer Nature (to be published)

Lashmet, S., and **Dockhorn, A.** (2025). Training a Reinforcement Learning Agent for Tales of Tribute, *Proceedings of the IEEE Conference on Games 2025*, IEEE, pp. 1-4.

Ronge, R., Albrecht, E., Woiwode, D., **Dockhorn, A.** (2025). Generating Ensembles of Search Policies to Solve Baba is You Levels, *Proceedings of the IEEE Conference on Games 2025*, IEEE, pp. 1-8

Fuchs, R., Droste, J., and **Dockhorn, A.**. (2025) How do Players Perceive Gender Discrimination? On the Differences of Harassment in Online Games, *Proceedings of the IEEE Conference on Games 2025*, IEEE, pp.

1-8 🏆 **Best Student Paper Award**

Schmöcker, R., and **Dockhorn, A.** (2025). Time-critical and confidence-based abstraction dropping methods, *Proceedings of the IEEE Conference on Games 2025*, IEEE, pp. 1-8

Xu, L., Liu, Z., **Dockhorn, A.**, Perez-Liebana, D., Wang, J., Song, L., Bian, J. (2024). Higher Replay Ratio Empowers Sample-Efficient Multi-Agent Reinforcement Learning, *Proceedings of the IEEE Conference on Games 2024*, IEEE, pp. 1-8

Xu, L. Perez-Liebana, D., **Dockhorn, A**. (2024). Strategy Game-Playing with Size-Constrained State Abstraction, *Proceedings of the IEEE Conference on Games 2024*, IEEE, pp. 1-8

Nübel, C., **Dockhorn, A.**, Mostaghim, S. (2024). Match Point AI: A Novel AI Framework for Evaluating Data-Driven Tennis Strategies, *Proceedings of the Conference on Games 2024*, IEEE, pp. 1-4

Oguz, M. K., **Dockhorn, A.** (2024). Markov Senior - Learning Markov Junior Grammars to Generate User-specified Content, *Proceedings of the IEEE Conference on Games 2024*, IEEE, pp. 1-8

Jiwatode, M., Schlecht, L., **Dockhorn, A.** (2024). Online Optimization of Curriculum Learning Schedules using Evolutionary Optimization, *Proceedings of the Conference on Games 2024*, IEEE, pp. 1-8

Fuchs, R., Gieseke, R., **Dockhorn, A.** (2024). Personalized Dynamic Difficulty Adjustment - Imitation Learning Meets Reinforcement Learning, *Proceedings of the IEEE Conference on Games 2024*, IEEE, pp. 1-2

Apeldoorn, D., **Dockhorn, A.**, Panholzer T. (2024). AbstractSwarm Multi-Agent Logistics Competition: Multi-Agent Collaboration for Improving A Priori Unknown Logistics Scenarios, *Proceedings of the Genetic and Evolutionary Computation Conference Companion, Association for Computing Machinery*, p. 1–2, Melbourne, VIC, Australia

Mohan, A., Benjamins, C, Wienecke, K, **Dockhorn, A**, & Lindauer, M. (2023). Extended Abstract: AutoRL Hyperparameter Landscapes, *Second International Conference on Automated Machine Learning*, (pp. 1-6), PMLR.

Olson, C., Wagner, L., & **Dockhorn, A.** (2023). Evolutionary Optimization of Baba Is You Agents, *Proceedings of the 2023 IEEE Congress on Evolutionary Computation*, (pp. 1-8), IEEE.

Lee, C.-S., Wang, M.-H, Chen, C.-Y., Yang, F.-J. Yang, & **Dockhorn. A.** (2023). Genetic Assessment Agent for High-School Student and Machine Co-Learning Model Construction on Computational Intelligence Experience, *Proceedings of the 2023 IEEE Congress on Evolutionary Computation*, IEEE, (pp. 1-8), IEEE.

Wagner, L., Olson, C., & **Dockhorn, A.** (2022). Generalizations of Steering - A Modular Design. In: *Proceedings of the 2022 IEEE Conference on Games*, (pp. 1-4), IEEE.

Xu, L, Hurtado-Grueso, J., Jeurissen, D., Perez-Liebana, D., & **Dockhorn, A.** (2022). Elastic Monte Carlo Tree Search with State Abstraction for Strategy Game Playing. In: *Proceedings of the 2022 IEEE Conference on Games*. (pp. 1-8). IEEE.

Dockhorn, A., Mostaghim, S., Kirst, M., & Zettwitz, M. (2021). Multi-Objective Optimization and Decision-Making in Context Steering. In: *Proceedings of the 2021 IEEE Conference on Games*. (pp. 1-8). IEEE.

Dockhorn, A., Hurtado-Grueso, J., Jeurissen, D., Xu, L, & Perez-Liebana, D., Game State and Action Abstracting Monte Carlo Tree Search for General Strategy Game-Playing, In: *2021 IEEE Conference on Games (CoG)*. (pp. 1-8) IEEE.

Perez-Liebana, D., Guerrero-Romero, C., **Dockhorn, A.**, Xu, L.& Jeurissen, D. (2021). Generating Diverse and Competitive Play-Styles for Strategy Games. In: *Proceedings of the 2021 IEEE Conference on Games*. (pp. 1-8). IEEE.

Dockhorn, A., Hurtado, J., Jeurissen, D., Xu, L., & Pérez-Liébana, D. (2021) Portfolio Search and Optimization for General Strategy Game-Playing. In *Proceedings of the Congress on Evolutionary Computation (CEC)*. (pp. 2085-2092), IEEE. 🏆 **Best Paper Runner-Up Award**

Dockhorn, A., & Kruse, R. (2020). Forward Model Learning for Motion Control Tasks. *Proceedings of the IEEE Intelligent Systems IS'20*, (pp. 1-5). IEEE. 🏆 **Best Paper Award**

Dockhorn, A., & Lucas, S. (2020). Local Forward Model Learning for GVGAI Games. In: *Proceedings of the 2020 IEEE Conference on Games*. (pp. 1-8). IEEE.

Dockhorn, A., Lucas, S. M., Volz, V., Bravi, I., Gaina, R. D., & Pérez-Liébana, D. (2019). Learning Local Forward Models on Unforgiving Games. *In: Proceedings of the 2019 IEEE Conference on Games* (pp. 1–4). IEEE.

Lucas, S. M., **Dockhorn, A.**, Volz, V., Bamford, C., Gaina, R. D., Bravi, I., Pérez-Liébana, D., Mostaghim, S., & Kruse, R. (2019). A Local Approach to Forward Model Learning: Results on the Game of Life Game. *In: Proceedings of the 2019 IEEE Conference on Games*, 1–8. IEEE

Dockhorn, A., Schwensfeier, T., & Kruse, R. (2019). Fuzzy Multiset Clustering for Metagame Analysis. *In Proceedings of the 2019 Conference of the International Fuzzy Systems Association and the European Society for Fuzzy Logic and Technology (EUSFLAT 2019)*, (pp. 1-8). Paris, France: Atlantis Press. 🏆 **Distinguished Student Paper**

Dockhorn, A., Tippelt, T., & Kruse, R. (2019). Model Decomposition for Forward Model Approximation. *In 2018 IEEE Symposium Series on Computational Intelligence* (pp. 1751–1757). IEEE.

Dockhorn, A., & Apeldoorn, D. (2018). Forward Model Approximation for General Video Game Learning. *In Proceedings of the 2018 IEEE Conference on Computational Intelligence and Games* (pp. 425–432). IEEE.

Dockhorn, A., Frick, M., Akkaya, Ü., & Kruse, R. (2018). Predicting Opponent Moves for Improving Hearthstone AI. *In 17th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems*, IPMU 2018 (pp. 621–632). Springer International Publishing.

Sabsch, T., Braune, C., **Dockhorn, A.**, & Kruse, R. (2017). Using a Multiobjective Genetic Algorithm for Curve Approximation. *In 2017 IEEE Symposium Series on Computational Intelligence*, (pp. 1-6). IEEE.

Dockhorn, A., & Kruse, R. (2017). Combining cooperative and adversarial coevolution in the context of pac-man. *In 2017 IEEE Conference on Computational Intelligence and Games*, CIG 2017 (pp. 60–67). IEEE.

Dockhorn, A., Doell, C., Hewelt, M., & Kruse, R. (2017). A decision heuristic for Monte Carlo tree search doppelkopf agents. *In 2017 IEEE Symposium Series on Computational Intelligence* (pp. 1–8). IEEE.

Dockhorn, A., Braune, C., & Kruse, R. (2016). Variable density based clustering. *In 2016 IEEE Symposium Series on Computational Intelligence* (pp. 1–8). IEEE.

Dockhorn, A., Braune, C., & Kruse, R. (2015). An Alternating Optimization Approach based on Hierarchical Adaptations of DBSCAN. *In 2015 IEEE Symposium Series on Computational Intelligence* (pp. 749–755). IEEE.

Held, P., **Dockhorn, A.**, Krause, B., & Kruse, R. (2015). Clustering Social Networks Using Competing Ant Hives. *In 2015 Second European Network Intelligence Conference* (pp. 67–74). IEEE.

Held, P., **Dockhorn, A.**, & Kruse, R. (2014). On Merging and Dividing of Barabasi-Albert-graphs. *In 2014 IEEE Symposium on Evolving and Autonomous Learning Systems* (Vol. 444, pp. 17–24).

Held, P., **Dockhorn, A.**, & Kruse, R. (2014). Generating Events for Dynamic Social Network Simulations. *15th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems*, IPMU 2014. Communications in Computer and Information Science, vol 443 (pp. 46-56). Springer, Cham

Workshop Papers (5)

Cook, M., Charity., M., Awiszus, M., **Dockhorn, A.**, & Carnovalini, F. (2025). We Call This Controller Skip: AI for Speedrunning. In *Experimental AI in Games (EXAG), AIIDE 2025 Workshop*, (pp. 1-12). AAAI (accepted for publication)

Xu, L., Pérez-Liébana, D., & **Dockhorn, A.** (2022). Towards Applicable State Abstractions: a Preview in Strategy Games. In *The Multi-disciplinary Conference on Reinforcement Learning and Decision Making*

(RLDM) - RL as a Model of Agency Workshop, (pp. 1-7). RLDM

Dockhorn, A., Jeurissen, D., Hurtado, J, & Pérez-Liébana, D. (2020). STRATEGA - A General Strategy Games Framework. In *Artificial Intelligence for Strategy Games Decision, AIIDE 2020 Workshop*, (pp. 1-7). AAAI

Gaina, R., Balla, M., **Dockhorn, A.**, Montolio, R., & Pérez-Liébana, D. (2020). TAG - Tabletop Games Framework. In *Experimental AI in Games (EXAG), AIIDE 2020 Workshop*, (pp. 1-7). AAAI

Dockhorn, A., & Kruse, (2018). Detecting Sensor Dependencies for Building Complementary Model Ensembles. *In Proceedings. 28. Workshop Computational Intelligence*, Dortmund, 29.-30. November 2018 (pp. 217–234).

Preprint Papers (3)

Pérez-Liébana, D, **Dockhorn, A.**, Hurtado Grueso, J., & Jeurissen D. (2020). The Design Of "Stratega": A General Strategy Games Framework, (pp. 1–7). `https://arxiv.org/abs/2009.05643`

Gaina, R. D., Balla, M., **Dockhorn**, A., Montoliu, R., & Pérez-Liébana D. (2020). Design and Implementation of TAG: A Tabletop Games Framework, (pp. 1–24). `https://arxiv.org/abs/2009.12065`

Dockhorn, A., & Mostaghim, S. (2019). Introducing the Hearthstone-AI Competition, (pp. 1–4). `http://arxiv.org/abs/1906.04238`

Theses and Dissertation (3)

Dockhorn, A. (2020). Dissertation: Prediction-based Search for Autonomous Game-Playing, (pp. 1–231). Otto von Guericke University of Magdeburg. 🏆 **Best Dissertation Award**

Dockhorn, A. (2015). Master Thesis: Hierarchical Extensions and Cluster Validation Techniques for DBSCAN, (pp. 1–101). Otto von Guericke University of Magdeburg.

Dockhorn, A. (2014). Bachelor Thesis: Computergestützte Analyse onkologischer Daten mithilfe Graphischer Modelle, (pp. 1–80). Otto von Guericke University of Magdeburg.

Talks and Presentations

Training a Reinforcement Learning Agent for Tales of Tribute — **Lisbon**
IEEE Conference on Games (COG) — *2025*

Training a Reinforcement Learning Agent for Tales of Tribute — **Lisbon**
IEEE Conference on Games (COG) — *2025*

Generating Ensembles of Search Policies to Solve Baba Is You Levels — **Lisbon**
IEEE Conference on Games (COG) — *2025*

Open-Ended NPC Dialogue Favors Casual Players: A Pilot Comparison of Three LLM-Driven Dialogue Systems — **Lisbon**
IEEE Conference on Games (COG) — *2025*

Talking to NPCs: Three LLM-Driven Approaches to Dynamic RPG Dialogue — **Lisbon**
IEEE Conference on Games (COG) — *2025*

Personalized Dynamic Difficulty Adjustment - Imitation Learning Meets Reinforcement Learning — **Milan**
IEEE Conference on Games (COG) — *2024*

Markov Senior - Learning Markov Junior Grammars to Generate User-specified Content — **Milan**
IEEE Conference on Games (COG) — *2024*

Keynote — Generating Predictive Models for Unknown Games — **Hannover (online)**
Workshop on Multimodal Analysis of Spatio-Temporal Data — *2023*

Invited Talk — Inside Games Research: More Than Playing Games — **USS Santiago de Chile (online)**
USS Insider Event — *2023*

Evolutionary Optimization of "Baba Is You" Agents — **Chicago**
IEEE Congress on Evolutionary Computation (CEC) — *2023*

Invited Talk — From Specialist to Generalist Game AI — **Hannover**
AI Grid - Meet Your Mentor — *2023*

Invited Talk — Machine Learning für Modell basierte Planung - Was wir von Game AI lernen können — **Hannover (online)**
LIFE 2050 — *2022*

Generalizations of Steering - A Modular Design — **Beijing (online)**
IEEE Conference on Games (COG) — *2022*

Keynote — Playing Games to Learn – From Specialist to Generalist AI — **San Juan (online)**
2022 IEEE Biennial Congress of Argentina (ARGENCON) — *2022*

Invited Talk — Unity für Steering, Path-Finding und Machine Learning — **Magdeburg (online)**
Acagamics e.V. — *2022*

Invited Talk — General Strategy Game Playing - A new challenge for AI — **Manchester (online)**
Manchester Metropolitan University — *2021*

Vorhersagebasierte Suche für autonomes Spielen — **Wadern (online)**
GI Disserationspreis — *2021*

Game State and Action Abstracting Monte Carlo Tree Search for General Strategy Game-Playing — **Copenhagen (online)**
IEEE Conference on Games (COG) — *2021*

Multi-Objective Optimization and Decision-Making in Context Steering — **Copenhagen (online)**
IEEE Conference on Games (COG) — *2021*

Portfolio Search and Optimization for General Strategy Game-Playing — **Kraków (online)**
IEEE Congress on Evolutionary Computation (CEC) — *2021*

Keynote — Predictive Search: Algorithms and Applications — **Zagreb (online)**
International Symposium on Signal and Image Processing (ISSIP) — *2020*

Plenary Lecture — Forward Model Learning for Motion Control Tasks — **Varna (online)**
IEEE Intelligent Systems (IS) — *2020*

STRATEGA - A General Strategy Games Framework — **Worcester (online)**
AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE) — *2020*

Local Forward Model Learning for GVGAI Games — **Osaka (online)**
IEEE Conference on Games (COG) — *2020*

Fuzzy Multiset Clustering for Metagame Analysis — **Prague**
11th Conference of the European Society for Fuzzy Logic and Technology (EUSFLAT) — *2019*

Learning Local Forward Models on Unforgiving Games — **London**
2019 IEEE Conference on Games (COG) — *2019*

Generalisation of Simulation-Based Search for Autonomous Gameplaying — **QMUL London**
Invited Talk - Game AI Research Group — *2019*

Generalisation of Simulation-Based Search for Autonomous Gameplaying — **OVGU Magdeburg**
Doktorandentag der Fakultät für Informatik — *2019*

Detecting Sensor Dependencies for Building Complementary Model Ensembles — **Dortmund**
28. Workshop Computational Intelligence — *2018*

Forward Model Approximation for General Video Game Learning — **Maastricht**
Conference on Computational Intelligence and Games (CIG) — *2018*

Predicting Opponent Moves for Improving Hearthstone AI — **Cádiz**
International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems (IPMU) — *2018*

A decision heuristic for Monte Carlo tree search doppelkopf agents — **Hawaii**
2016 IEEE Symposium Series on Computational Intelligence (SSCI) — *2017*

Using a Multiobjective Genetic Algorithm for Curve Approximation — **Hawaii**
2016 IEEE Symposium Series on Computational Intelligence (SSCI) — *2017*

Combining cooperative and adversarial coevolution in the context of pac-man — **New York**
Conference on Computational Intelligence and Games (CIG) — *2017*

Variable density based clustering — **Athen**
2016 IEEE Symposium Series on Computational Intelligence (SSCI) — *2016*

An Alternating Optimization Approach based on Hierarchical Adaptations of DBSCAN — **Cape Town**
2015 IEEE Symposium Series on Computational Intelligence (SSCI) — *2015*

Generating Events for Dynamic Social Network Simulations — **Montpellier**
2014 International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems (IPMU) — *2015*

Awards and Honours

Best Student Paper Award
IEEE Conference on Games 2025 for the paper — *2025*
"How do Players Perceive Gender Discrimination? On the Differences of Harassment in Online Games"

APFEL Preis für Exzellente Lehre
Leibniz University Hannover, Faculty of Electric Engineering and Computer Science — *2023*
"Award for Best Lecturer of the Year 2023"

Best Paper Runner-Up Award
IEEE Congress on Evolutionary Computation 2021 for the paper — *2021*
"Portfolio Search and Optimization for General Strategy Game-Playing"

Best Paper Award
IEEE Intelligent Systems 2020 for the paper — *2020*
"Forward Model Learning for Motion Control Tasks"

Best Dissertation Award
Department of Computer Science at the Otto von Guericke University — *2019/2020*

Distinguished Student Paper
EUSFLAT 2019 for the paper — *2019*
"Fuzzy Multiset Clustering for Metagame Analysis"

Best Presentation Award
Doctoral Symposium at the Otto von Guericke University *2019*

Nominee for the "Otto von Guericke Teaching Award" 2018
Otto von Guericke University *2018*

Runner-Up Teaching Award "Held der Lehre" for the seminar "Classification Algorithms"
Students council of the Department for Computer Science *2017/2018*

Runner-Up Teaching Award "Held der Lehre" for the tutorial on "Intelligente Systeme"
Students council of the Department for Computer Science *2015/2016*

Best Computer Science Master Graduate
Department of Computer Science at the Otto von Guericke University *2015/2016*

Grants and Sponsored Research Activities

Project (Funding Institution)	Total Funding Volume (k DKK)	Own Share (k DKK)
Novo Nordisk Start Grant Package (NNF)	6492	6492
HybrInt - Hybrid intelligence through interpretable AI in machine perception and interaction (MWK)	22525	1634
Generating Behavior Trees Using Large Language Models (DAAD)	149	75

Scholarship
"Graduiertenförderung des Landes Sachsen-Anhalt" *2016 – 2018*

Commitment

IEEE Computational Intelligence Society (IEEE CIS)
Chair of the IEEE CIS Competition Sub-Committee *2025,2020-2021*
Chair of the IEEE CIS Content Curation Subcommittee *2024*
Chair of the IEEE CIS Games Technical Committee *2022-2023*
Chair of the IEEE CIS Summer School Sub-Committee *2022-2023*
Member of the IEEE CIS Member Activities Committee *2021*
Chair of the IEEE CIS Website Sub-Committee *2021-2022*
Member of the IEEE CIS Women in Computational Intelligence Sub-Committee *2021-2022*
Member of the IEEE CIS Content Curation Sub-Committee *2022-2024*
Member of the IEEE CIS Student Activities Sub-Committee *since 2021*
Member of the IEEE CIS Education Committee *since 2020*
Member of the IEEE CIS Games Technical Committee *since 2020*
Vice-Chair of the IEEE CIS Competition Sub-Committee *2017-2019*

Computational Techniques for Tabletop Games Heritage (Game Table) network
Member *2025*

L3S Research Center, Lower Saxony
Member and Research Group Leader *2025*

Otto von Guericke University, Faculty of Computer Science
Member of the Research Commission *2016-2019*

Student Game Developer Club - Acagamics e.V.
Head of Teaching *2017-2018*
Head of Industry *2016-2017*

Faculty Student Council, Otto von Guericke University, Faculty of Computer Science
Organizer of several events *2013-2015*

Conference, Workshop, and Competition Organization

IEEE Conference on Games (COG)
Workshop and Tutorial Chair *2025*

IEEE Conference on Games (COG)
General Chair *2024*

IEEE Conference on Games (COG)
Proceedings Chair *2023*

IEEE Congress on Evolutionary Computation (CEC)
Competition Chair *2023*

IEEE World Congress on Computational Intelligence (WCCI)
Organizer of the Special Session on Games *2022*

IEEE Congress on Evolutionary Computation (CEC) &
Genetic and Evolutionary Computation Conference (GECCO) *2021-2022 (CEC)*
Organizer of the AbstractSwarm Multi-Agent Logistics Competition *2021-2024 (GECCO)*

IEEE Symposium Series on Computational Intelligence (SSCI)
Organizer of the Interactive Articles and Videos for Education Competition *2021*

International Conference on Cognitive and Intelligent Computing (ICCIC)
Member of the Advisory Committee *2021*

IEEE Conference on Games (COG)
Organizer of the General Strategy Game AI Competition *2021*
Tutorial on General Strategy Game AI *2021*

IEEE Congress on Evolutionary Computation (CEC)
Organizer of the Special Session on Games *2021*

IEEE Conference on Games (COG; former IEEE CIG)
Organizer of the Hearthstone AI Competition *2018-2020*

IEEE Conference on Games (COG; former IEEE CIG)
Organizer of the Short Video Competition *2019-2020*

Editor and Reviewer Activities

Journal — Associate Editor

- IEEE Computational Intelligence Magazine (CIM)
- IEEE Transactions on Games (TOG)

Journals — Reviewer

- IEEE Computational Intelligence Magazine (CIM)
- IEEE Transactions on Games (TOG)
- IEEE Transactions on Artificial Intelligence (TAI)
- IEEE Access
- ACM Computing Surveys
- Mathematics and Computers in Simulation (MATCOM)
- Transactions on Pattern Analysis and Machine Intelligence
- KI - Künstliche Intelligenz
- Elsevier Information Sciences
- International Journal of Neural Systems (IJNS)
- MDPI Sensors, MDPI Games
- IEEE Transactions on Emerging Topics in Computational Intelligence (TETCI)
- Expert Systems with Applications (ESWA)
- IEEE Transactions on Affective Computing (TAFFC)

Programme Committee Member

- The Genetic and Evolutionary Computation Conference (GECCO) 2021
- IEEE Conference on Games (COG), since 2019
- AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE) 2020

Conferences - Reviewer

- AAAI Conference on Artificial Intelligence (AAAI), 2024, 2023
- Foundations of Digital Games (FDG), 2023
- IEEE World Congress on Computational Intelligence (WCCI), 2022
- IEEE Conference on Games (COG), 2025, 2024, 2023, 2022, 2021, 2020, 2019
- IEEE Conference on Computational Intelligence in Games (CIG), 2018
- IEEE Symposium Series on Computational Intelligence (SSCI) 2022, 2020, 2016
- The Genetic and Evolutionary Computation Conference (GECCO) 2023, 2022, 2020
- Conference of the European Society for Fuzzy Logic and Technology (Eusflat) 2019
- International Conference on Artificial Intelligence and Soft Computing (ICAISC) 2019
- Conference on Hybrid Intelligent Systems (HIS) 2018
- Conference on Theory and Practice of Natural Computing (TPNC) 2018
- International Symposium on Intelligent Data Analysis (IDA) 2017, 2016
- Australasian Joint Conference on Artificial Intelligence (AI) 2016
- IEEE Intelligent Systems (IS) 2016

Teaching Activities

Lecturer of the SDU Metaverse Lab

Game Programming 2	*SS 2026*
Introduction to Game AI	*SS 2025/2026*
Modern Game Development	*WS 2025/2026*
Game AI Seminar	*WS 2025/2026*

Lecturer of the Institute for Information Processing

Introduction to Game Development	*WS 2023/2024* *WS 2022/2023*
Graph-based Machine Learning	*SS 2024* *SS 2023*
Seminar: Reinforcement Learning	*SS 2022*

Appointed Lecturer of the *Visual Computing* working group
Einführung in Digitale Spiele *WS 2023/2024*

Appointed Lecturer of the *Computational Intelligence* working group
Computational Intelligence in Games *SS 2018*

Teaching Assistant of the *Computational Intelligence* working group
Fuzzy Systems *SS 2019*

Bayes Networks WS2021/2022
WS 2019/2020
WS 2018/2019
WS 2017/2018
WS 2015/2016

Computational Intelligence in Games *SS 2019*
SS 2017

Neural Networks *SS 2018*
SS 2015

Seminar Classification Algorithms *WS 2017/2018*

Intelligente Systeme *WS 2015/2016*
WS 2014/2015

Einführung in die Informatik *WS 2011/2012*

(Co-)Supervised Theses

on-going

Abstractions in Search and Reinforcement Learning (working title) **PhD Thesis**
Robin Schmöcker

Causal Reinforcement Learning (working title) **PhD Thesis**
Mohit Jiwatode

Abstract Forward Models for Game AI (working title) **PhD Thesis**
Linxie Xu

2025

A Comprehensive Study of Early and Late Fusion Strategies in Multimodal Embedding Models **Master Thesis**
Trong Tat Vu

2024

Dynamic Configuration of Elastic Monte Carlo Tree Search **Bachelor Thesis**
Merle-Sophie Carlotta Wagner

Dynamically Adjusting the Use of State Abstractions in Elastic Monte Carlo Tree Search **Bachelor Thesis**
Dominik Schulz

Designing Repair Mechanisms to Guarantee Playability of Procedurally Generated Levels — **Bachelor Thesis**
Jerrit Gustav Gläsker

Analysing the Metagame and Team Dynamics in Competitive MOBA Games — **Bachelor Thesis**
Leo Thern

Monte Carlo-Baum-Suchverfahren auf der Grundlage eines Graphischen Neuronalen Netzes — **Bachelor Thesis**
Aaron Sava

Erweiterung des Deep Phase Ansatzes auf verschiedene Eingabemodalitäten — **Master Thesis**
Karsten Fuhrberg

Short-Term Forecasting of Solar Irradiance with Deep Learning: Application and Enhancement of State-of-the-Art Methods — **Master Thesis**
Sebastian Böker

Lernen verallgemeinerbarer Zustandsbewertungsheuristiken — **Bachelor Thesis**
Erik Albrecht

Exploring Generalization and Transfer Learning in AI Agents across Games — **Master Thesis**
Malte Hermann

Minecraft Architecture Design Using Wave Function Collapse — **Bachelor Thesis**
Henrik Bajon

Predicting Tire Degradation based on Road Network Analysis — **Master Thesis**
Maria Camila Chavez Tobar

2023

Minecraft Settlement Generation Using Wave Function Collapse — **Bachelor Thesis**
Josephine Gisela Helene Klein — *2023*

Dynamically Adjusting the Use of State Abstractions in Elastic Monte Carlo Tree Search — **Bachelor Thesis**
Dominik Schulz — *2023*

Neural Architecture Search for Dynamic Difficulty Adjustment of AI Agents — **Bachelor Thesis**
Robin Gieseke — *2023*

Optimierung von Portfolio Kompositionen zur Laufzeit — **Bachelor Thesis**
Linus Tristan Rattay — *2023*

Einbettung von Kontextinformationen in Wave Function Collapse — **Bachelor Thesis**
Marian Ryt — *2023*

Training and Combining Weak Reinforcement Learners for Enhanced Performance — **Master Thesis**
Robin Schmöcker — *2023*

Interpreting Latent Vector Representations of World Models — **Bachelor Thesis**
Marcel Korneck — *2023*

Optimizing Draft Recommendations for MOBA Games Based on General Win Rates and Individual Player Performance — **Bachelor Thesis**
Gregor Voigts — *2023*

Learning Markov Junior Rule-bases to Generate User-specified Content — **Bachelor Thesis**
Mehmet Kayra Oguz — *2023*

Dynamic Difficulty Adjustment for Procedural Content Generation in TOAD-GAN — **Bachelor Thesis**
Dominic Ludorff — *2023*

Development of surrogate models for decentralized energy supply systems — **Bachelor Thesis**
Julian Schwarzien — *2023*

Designing Repair Mechanisms to Guarantee Playability of Procedurally Generated Levels — **Bachelor Thesis**
Jerrit Gustav Gläsker — *2023*

Optimizing Deck-drafting Strategies for Collectible Card Game AI using Evolutionary Algorithms — **Bachelor Thesis**
Lennart Viet — *2023*

Online Optimization of Curriculum Learning Schedules using Evolutionary Optimization — **Master Thesis**
Leon Schlecht — *2023*

2022

Driving-AI for Real-Time-Traffic-Simulations — **Bachelor Thesis**
Marius Schmidt — *2022*

Search-based Procedural Content Generation with Rolling Horizon Evolutionary Algorithm for Tile-based Map Generation — **Master Thesis**
Christian Wustrau — *2022*

Optimizing Deck-building Strategies for Collectible Card Game AI — **Bachelor Thesis**
Can Tuna — *2022*

Quality Diversity Optimization for Portfolio-Based Search Algorithms in Real-Time Strategy Games — **Bachelor Thesis**
Till Isenhuth — *2022*

Context Steering with Differential-Drive Robots: Reactive Navigation based on Multi-Objective Decision-Making — **Master Thesis**
Nele Traichel — *2022*

2021

Action Abstractions and Real-Time Search for RTS Games (working title) — **Master Thesis**
Muttahir Mumtaz — *2021*

Procedural Generation of Rube Goldberg Machines (working title) — **Bachelor Thesis**
Tomoya Hömberg — *2021*

2020

Neural Network-based Adaption of Rapidly Exploring Random Trees for Motion Planning — **Master Thesis**, *2020*
Maximilian Kühn

2019

DeePolation: AI-based interpolation on multi-dimensional spherical sensors — **Master Thesis**, *2019*
Martin Zettwitz

Clustering of Longitudinal Disease Progression Data — **Master Thesis**, *2019*
Aditya Nemali

Evolutionäre Agenten-Generierung für HearthStone — **Bachelor Thesis**, *2019*
Bastian Heinrich

Schaffung von Modellierungsansätzen zur Interaktionsvorhersage unbekannter Spiele — **Master Thesis**, *2019*
Tim Tippelt

Multivariate Time Series Sensor Data Clustering — **Master Thesis**, *2019*
Sourabh Dandage

Prediction of Player Moves in Collectible Card Games — **Master Thesis**, *2019*
Tony Schwensfeier

2018

Multikriterielle Wegfindung für Agentengruppen — **Bachelor Thesis**, *2018*
Maurice Hoffmeister

Classification of Differently Trained Larvae based on Changes in their Trajectories using Artificial Neural Networks — **Bachelor Thesis**, *2018*
Jonathan Spiegel

Robust and Transferable Reflectance Reconstruction Using Deep Neural Networks — **Master Thesis**, *2018*
Cornelius Styp von Rekowski

Regression Analysis for Power Consumption of a Production Plant — **Master Thesis**, *2018*
Sujan Adhikari

Ermitteln der Siegbedingung unbekannter Spiele durch Assoziationsanalyse — **Bachelor Thesis**, *2018*
Chris Saxton

Optimising All-Shortest-Path Dictionaries using Machine Learning — **Master Thesis**, *2018*
Jannis Becke

Designing an Interface between Data System and Root Cause Evaluation to enhance analysis strategy utilizing a larger Database for Tire Design, Manufacturing and Evaluation Process — **Master Thesis**, *2018*
Pankaj Narula

2017

Entscheidungsheuristische Erweiterung des UCT-Algorithmus für Doppelkopf — **Master Thesis**, *2017*
Matthias Hewellt

Kursverlaufvorhersage von Wertpapieren mit Hilfe von Ensemble Classification — **Bachelor Thesis**, *2017*
Leopold Ryll

Examples of Press and Publicity

Public presentation of our Game AI Working group — **Hannover (online)**, *2024*
Digitales Hannover

Interview Guest - Translated Title: "Interview with Alex - How do AI and Gaming Fit Together" — **Coding Buddies Podcast**, *2023*

Presentation on Unity for Steering, Path-Finding and Machine Learning — **Magdeburg (online)**, *2022*
Acagamics e.V.