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Exploring the synergies between transfer in reinforcement learning and procedural content generation

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Curriculum Vitae

Matthias Müller-Brockhausen was born on the 24th of August, 1994, in Bonn, Germany. In 2016 he obtained his BSc in Computer Science from the Munich University of Applied Sciences. Continuing to follow his passion for computers in 2020 he graduated cum laude with a MSc degree in Computer Science at Leiden University. Due to his love for software development, he was also the Founder and CTO of ClimbZ GmbH from 2016 to 2018, where he led the development of an isomorphic app first in the Meteor framework (v1) and later transitioned to using React & React Native (v2). In 2020 he started a PhD research position in Reinforcement Learning at Leiden University. His research interests lie in AI for (video)games. Before starting his PhD position he gained experience as a Teaching Assistant for the courses Reinforcement Learning & Modern Game AI between January 2020 and June 2020. During his PhD studies, he followed a variety of courses furthering his understanding of the research world such as scientific conduct where he learned the values of integrity and how to produce research in an honest ethical manner. Moreover, he followed courses to acquire the University Teaching Qualification (UTQ). With this qualification in hand, he plans on continuing his career as a University Lecturer.

List of Publications

Primary Author

- Müller-Brockhausen, M., Preuss, M., Plaat, A.: A new challenge: Approaching tetris link with AI. In: 2021 IEEE Conference on Games (CoG), Copenhagen, Denmark, August 17-20, 2021. IEEE (2021), <https://doi.org/10.1109/CoG52621.2021.9619044>
- Müller-Brockhausen, M., Preuss, M., Plaat, A.: Procedural content generation: Better benchmarks for transfer reinforcement learning. In: 2021 IEEE Conference on Games (CoG), Copenhagen, Denmark, August 17-20, 2021. IEEE (2021), <https://doi.org/10.1109/CoG52621.2021.9619000>
- Müller-Brockhausen, M., Plaat, A., Preuss, M.: Towards verifiable benchmarks for reinforcement learning. In: IEEE Conference on Games, CoG 2022, Beijing, China, August 21-24, 2022. pp. 159–166. IEEE (2022), <https://doi.org/10.1109/CoG51982.2022.9893715>
- Müller-Brockhausen, M., Khalifa, A., Preuss, M.: Scalable procedural content generation via transfer reinforcement learning. In: Data Science and Artificial Intelligence (DSAI). Springer (2024), <https://doi.org/10.1007/978-981-97-9793-6>
- Müller-Brockhausen, M., Barbero, G., Preuss, M.: Chatter generation through language models. In: IEEE Conference on Games, CoG 2023, Boston, MA, USA, August 21-24, 2023. IEEE (2023), <https://doi.org/10.1109/CoG57401.2023.10333244>

Collaborated on

- Kampert, D., Varbanescu, A.L., Müller-Brockhausen, M., Plaat, A.: Mimicking the human approach in the game of hive. In: IEEE Symposium Series on Computational Intelligence, SSCI 2021, Orlando, FL, USA, December 5-7, 2021. IEEE (2021), <https://doi.org/10.1109/SSCI50451.2021.9659999>

List of Publications

- Müller-Brockhausen, M., Plisnier, H.: Transferring while playing the rl agent. In: Demo at BNAIC/BeNeLearn 2022: Joint International Scientific Conferences on AI and Machine Learning (2022), https://bnaic2022.uantwerpen.be/wp-content/uploads/BNAICBeNeLearn_2022_submission_6564.pdf
- van der Staaij, A., Prins, J., Prins, V.L., Poelsma, J., Smit, T., Müller-Brockhausen, M., Preuss, M.: Believable minecraft settlements by means of decentralised iterative planning. In: IEEE Conference on Games, CoG 2023, Boston, MA, USA, August 21-24, 2023. IEEE (2023), <https://doi.org/10.1109/CoG57401.2023.10333146>
- Barbero, G., Müller-Brockhausen, M., Preuss, M.: Challenges of open world games for ai: Insights from human gameplay. In: Data Science and Artificial Intelligence (DSAI). Springer Nature (2024), <https://doi.org/10.1007/978-981-97-9793-6>

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