

University Academic Curriculum Vitae

Personal information Mena Leemhuis

Education since leaving school

- 2018, B.Sc. in Medical Computer Science (University of Lübeck)
- 2020, M.Sc. in Medical Computer Science (University of Lübeck)
- 2024, PhD in Neuro-symbolic AI, “Conceptual Orthospaces — An Embedding Framework Accounting for Negation Operators and Convexity Constraints” (with distinction) (University of Lübeck)

Present appointment

- Research assistant (AR)
- Start date: 01.09.2024
- Project funded by the Research Südtirol/Alto Adige
- At the University of Bozen/Bolzano

Professional experience

From / to	Job title	Name of academic Institution	Academic level	Responsibilities
01.11.2018-31.08.2019	Research assistant	Institute for Electrical Engineering in Medicine, University of Lübeck	Master student	Theoretical development and implementation of Factor Graphs
15.10.2019-14.02.2020	Research assistant	Institute for Electrical Engineering in Medicine, University of Lübeck	Master student	Theoretical development and implementation of Factor Graphs
01.04.2019-30.06.2019	Teaching assistant	Institute for Theoretical Computer Science, University of Lübeck	Master student	Leading lab session for a database course
15.10.2019-14.02.2020	Teaching assistant	Institute for Theoretical Computer Science, University of Lübeck	Master student	Leading lab session for a algorithm course
01.04.2020-30.09.2020	Research assistant	Institute of Information Systems, University of Lübeck	Master student	Research on neuro-symbolic AI
15.10.2020-30.06.2024	Research assistant	Institute of Information Systems, University of Lübeck	PhD student	Theoretical foundations and implementation of an ontology-based data access approach for modeling smart materials and their interactions

Memberships

- Member of the program committee of ECAI, the Workshop on Formal and Cognitive Reasoning (FCR), FoIKS

Research and scholarships

- Neuro-symbolic AI, especially embeddings of expressive description logic ontologies in a vector space
- Considerations on the logic representable by geometric embeddings
- Analogies and the embedding of analogies into a vector space
- Conceptual Blending

Publications Conference papers

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- Özgür L. Özçep, Mena Leemhuis and Diedrich Wolter. „Cone

- Semantics for Logics with Negation“. In: Proceedings of the Twenty-Ninth International Joint Conference on Artificial Intelligence, IJCAI-20. International Joint Conferences on Artificial Intelligence Organization, Juli 2020, S. 1820–1826. doi: 10.24963/ijcai.2020/252
- *Mena Leemhuis*, Özgür L. Özçep and Diedrich Wolter. „Multi-label Learning with a Cone-Based Geometric Model“. In: Proceedings of the 25th International Conference on Conceptual Structures (ICCS 2020). Springer International Publishing, 2020, S. 177–185. doi: 10.1007/978-3-030-57855-8_13
 - (*) • *Mena Leemhuis*, Özgür L. Özçep and Diedrich Wolter. „Knowledge Graph Embeddings with Ontologies: Reification for Representing Arbitrary Relations“. In: German Conference on Artificial Intelligence (Künstliche Intelligenz). Edited by R. Bergmann, L. Malburg, S.C. Rodermund and I.J. Timm. Lecture Notes in Computer Science 2 13404. Springer International Publishing, 2022, S. 146–159. doi: 10.1007/978-3-031-15791-2_13
 - *Hedda Rahel Schmidtke*, Mena Leemhuis, Jana Mertens, Robert Courant, Jürgen Maas and Özgür L. Özçep. „Bridging the Gap: Intelligent Environments with Smart Materials“. In: 19th International Conference on Intelligent Environments (IE). IEEE, 2023, S. 1–8. doi: 10.1109/IE57519.2023.10179095
 - *Jana Mertens*, Mena Leemhuis, Hedda R. Schmidtke, Özgür L. Özçep and Jürgen Maas. „Digitalized data access of DE material models and their parameters using an OBD(M)A approach“. In: Electroactive Polymer Actuators and Devices (EAPAD) XXV. Hrsg. von John D. Madden, Iain A. Anderson and Herbert R. Shea. SPIE, 2023. doi: 10.1117/12.2661222
 - *Simon Schiff*, Mena Leemhuis, Özgür L. Özçep and Ralf Möller. „Query Transformation for Processing Streams in Decision-making Agents“. In: The International FLAIRS Conference Proceedings. Bd. 36. University of Florida George A Smathers Libraries, 2023. doi: 10.32473/flairs.36.133104
 - *Mena Leemhuis* and Oliver Kutz (to appear). „Introducing Pathomalgametry: Conceptual Blending with Geometric Path-finding and Amalgamation“. In: International Conference on Computational Creativity (ICCC’25), Campinas, Brazil
- (*) • Journal articles in refereed academic journals
 - *Mena Leemhuis*, Özgür L. Özçep and Diedrich Wolter. „Learning with cone-based geometric models and orthologics“. In: Annals of Mathematics and Artificial Intelligence 90 (2022), S. 1–37. doi: 10.1007/s10472-022-09806-1
 - (*) • *Mena Leemhuis* and Özgür L. Özçep. „Conceptual Orthospaces—Convexity Meets Negation“. In: International Journal of Approximate Reasoning 162 (2023), S. 109013. doi: 10.1016/j.ijar.2023.109013
 - (*) • *Özgür L. Özçep*, Mena Leemhuis and Diedrich Wolter. „Embedding Ontologies in the description logic ALC by Axis-Aligned Cones“. In: Journal of Artificial Intelligence Research 78 (2023), S. 217–267. doi: 10.1613/jair.1.13939
 - (*) • Jürgen Maas, Mena Leemhuis, Jana Mertens, Hedda Schmidtke, Robert Courant, Martin Dahmann, Sebastian Stark, Andrea Böhm, Kenny Pagel, Maximilian Hinze, Daniel Pinkal, Michael Wegener, Martin Wagner, Thomas Sattel, Holger Neubert and Özgür L. Özçep. „A novel digitalization

- approach for smart materials – ontology-based access to data and models.” Advanced Engineering Materials (2024). doi: 10.1002/adem.202302208
- *Özgür L. Özçep, Mena Leemhuis, Maximilian Winkler, Robert Courant, Thomas Sattel, and Jürgen Maas (2024). “Modeling and Accessing Smart Materials with Shapes Constraint Language Integrity Constraints and Ontologies—The SmaDi Way”. In: Advanced Engineering Materials. doi: 10.1002/adem.202401017*
 - Other publications
 - *Mena Leemhuis und Özgür L. Özçep. „A Goodman-style Betweenness Relation on Orthoframes“. In: Proceedings of the 8th Workshop on Formal and Cognitive Reasoning, co-located with the 45th German Conference on Artificial Intelligence (KI 2022). Edited by Christoph Beierle, Marco Ragni, Kai Sauerwald, Frieder Stolzenburg and Matthias Thimm. 2022*
 - *Mena Leemhuis and Özgür L. Özçep. „Analogical Proportions and Betweenness“. In: Proceedings of the 9th Workshop on Formal and Cognitive Reasoning, co-located with the 46th German Conference on Artificial Intelligence (KI 2023). 2023, S. 8–19*
 - *Mena Leemhuis, Diedrich Wolter and Özgür L. Özçep. „Decomposing Analogy: A Logic Characterization“. In: Proceedings of the 13th International Symposium on Foundations of Information and Knowledge Systems (FOIKS 2024). 2024*
 - *Mena Leemhuis, Diedrich Wolter und Özgür L. Özçep. „Rules of Partial Orthomodularity“. In: Workshop on Logic, Language, Information and Computation (WOLLIC 2024). 2024 doi: 10.1007/978-3-031-62687-6_8*
 - *Mena Leemhuis and Oliver Kutz (2024). “A Cloud Full of Paths: Conceptual Blending as Betweenness Relation”. In: The Eighth Image Schema Day (ISD8), November 27-28, 2024, Bozen-Bolzano, Italy. CEUR Workshop proceedings*

Further data

- Selected talk at International Conference on Conceptual Structures (ICCS 2020)
- Selected talk at the Workshop on Bilateralism and Proof-Theoretic Semantics (2022)
- Talk at the Madeira Workshop on Belief Revision, Argumentation, Ontologies, and Norms (2022)
- Selected talk at German Conference of AI (KI 2022)
- Selected talk at the Workshop on Formal and Cognitive Reasoning (FCR 2022, FCR 2023)
- Selected talk at International Symposium on Foundations of Information and Knowledge Systems (FOIKS 2024)
- Selected talk at Workshop on Logic, Language, Information and Computation (WOLLIC 2024)
- Invited talk at the workshop “Analogies in Physics and Beyond” in Milan, 2024

Language competence

German: Native speaker
 English: C1
 Italian: A1