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Dr. Benedikt Zönnchen

Curriculum Vitae

Academic Career

10/2023 - today	**Head of Research**, *Munich Center for Digital Sciences and AI*
2021	**Dr. rer. nat. in Informatics**, summa cum laude, *Technical University of Munich* Thesis: Efficient parallel algorithm for pedestrian simulation. Supervised by Prof. Hans-Joachim Bungartz (TUM) & Prof. Gerta Köster (HM)
03/2016 - 07/2020	**PhD Candidate**, *Hochschule München University of Applied Sciences*
10/2013 - 02/2016	**Informatics (M. Sc.)**, *Technical University of Munich*
10/2010 - 09/2013	**Informatics (B. Sc.)**, *Hochschule München University of Applied Sciences*

Non-Academic Work Experience

09/2022 - 02/2023	**Lecturer**, *Hochschule München University of Applied Sciences*
02/2022 - 09/2023	**Educational-Tech Engineer**, *Hochschule München University of Applied Sciences*
08/2020 - 01/2022	**Senior Advisor for Computer Science Education**, *Hochschule München University of Applied Sciences*
03/2011 - 10/2011	**Software Developer (student employee)**, *Prevero AG*
09/2008 - 07/2009	**Web Developer**, *Nokia Siemens Networks GmbH & Co. KG*
09/2005 - 07/2008	**Software Developer (professional training)**, *Siemens AG*

Research Interests

AI & Systems Theory	I explore human–AI co-creativity and co-evolution as emergent socio-technical processes, in which AI systems are shaped by feedback loops, develop operational closure, and draw on the contingencies generated through communication.
AI in Culture, Arts and Education	I apply this lens to the fields of culture, arts, and education to examine how generative AI transforms creative practices, roles, and learning environments.

Other Interests

Open Eduction	Free and open education, schooling and education in the digital era
Complex Systems	How do complex system interact? What is the relation of entropy and complexity?
Philosophy	Constructivism, Philosophy of Mind, Phenomenology, Existentialism, Philosophy of Language
Creative Coding	Live Programming, Algorithmic Composition, Sound Design, Generative Design
Formal methods	Automata Theory, Logic, Laws of Form

Recent Publications

2025 **Zönnchen, B.**, Dzhimova, M. & Socher, G. (2025). From intelligence to autopoiesis: rethinking artificial intelligence through systems theory. *Frontiers in Communication*. Vol. 10. 10.3389/fcomm.2025.1585321

2025 **Zönnchen, B.**, Hobelsberger, M., Socher, G., Thurner, V. & Ottinger, S. (2025). Exploring the role of large language models as artificial tutors. In Proceedings of the *2025 IEEE Education Engineering Conference*. 10.1109/EDUCON62633.2025.11016571

2024 **Zönnchen, B.**, Thurner, V. & Böttcher, A. (2024). On the Impact of ChatGPTon teaching and studying software engineering. In Proceedings of the *2024 IEEE Education Engineering Conference*. 10.1109/EDUCON60312.2024.10578680

Recent Talks

2025 **Introduction to Artificial Intelligence and Machine Learning**, Artificial Intelligence in Culture and Arts (AICA), Wavelab, `link`

2024 **A Systemic View on Society**, Munich Creative Business Week 2024, `link`

2024 **AI as a Tool of Emancipitation?**, IGA Convention

2023 **Generative AI in the Context of XR**, XR for the middle class, IHK Munich, `link`

2023 **Generative AI: Between Tool and Communication Partner**, Ready for the future: AI-skills as part of the curriculum, Dialogue forum, HM

Practical experience

Software Development & Machine Learning

Python **Expert**, Python developer since 2016 (NumPy, Pandas, Django, SciPy), scripting, trainer for Python, author of an open textbook (`Link`)

Java **Expert**, Java developer since 2006, main contributor to the open-source simulation framework Vadere (`Link`), language of my education at Siemens and the bachelor program

PyTorch, Scikit-learn **Expert**, teaching, development of a melody generator (LSTM, Transformer)

spaCy, BERTopic **Proficient**, rule-based and tranformer-based topic text analyis and topic modeling

OpenCL **Proficient**, GPU programming during my PhD project

JS, HTML, CSS, PHP **Proficient**, contributor to a social media platform (1 year), p5.js visualizations (`Link`)

C/C++ **Proficient**, high performance computing during my PhD project

Database, SQL **Proficient**, constant use during my work as software developer

Rust, Scala, Haskell **Basic**, personal interest, music making with TidalCycles

Other Technologies

Git **Expert**, Git user since 2011

LaTeX **Expert**, LaTeX advocate since 2011

SuperCollider **Expert**, DSP, sound design, live programming, author of an open textbook (`Link`)

Jupyter ecosystem **Proficient**, deploayment of a JupyterHub, Development of Jupyter notebooks for my students, author of an interactive Jupyter book

Docker, Kubernetes **Basic**, usage in the context of education and scientific work

Teaching

Winter 2025/26 **Sustainable AI**, lecture (bachelor), *trainer and coordinator*, HM

Winter 2023/24 **Artificial Intelligence in Culture and Arts**, project-based workshop, *trainer*, HM & HMTM

Winter 2023/24 **Sustainable AI**, lecture (bachelor), *trainer and coordinator*, HM

Sommer 2023 **Artificial Intelligence in Culture and Arts**, workshop, *Trainer*, HM & HMTM

Winter 2022/23 **Sustainable AI**, lecture (bachelor), *lecturer*, HM

Winter 2022/23 **Computational Thinking**, lecture (bachelor), *trainer*, HM

Winter 2021/22 **Computational Thinking**, lecture (bachelor), *trainer*, HM

Annually since 2020 **Preparation for Computer Science**, 5-day course (bachelor), *trainer and coordinator*, HM

Winter 2019/20 **Machine Learning in Crowd Modeling and Simulation**, *guest lecture*, TUM

Winter 2016/17 **Linear Algebra**, lecture (bachelor), *lecturer*, HM

Summer 2016 **Scientific Computing**, Seminar (bachelor), *lecturer*, HM

Summer 2016 **Theoretical Computer Science**, lecture (bachelor), *trainer*, HM

Scholarships & awards

2023 **MINT Challenge award** (Award for the course *Sustainable AI*)

2022 **Dissertation award** (Oskar-von-Miller Award)

2021 **Dissertation award** (Bund der Freunde der Technischen Universität München e. V.)

2012 – heute Alumni of the **German Academic Scholarship Foundation** (Studienstiftung des deutschen Volkes) and the **Max Weber-Program of the State of Bavaria** (Max Weber-Programm Bayern)

2013 **RiMEA sponsorship award**, **Valedictorian**

Publication List

2025 **Zönnchen, B.**, Dzhimova, M. & Socher, G. (2025). From Intelligence to Autopoiesis: Rethinking Artificial Intelligence through Systems Theory. *Frontiers in Communication*. Vol. 10. 10.3389/fcomm.2025.1585321

2025 **Zönnchen, B.**, Hobelsberger, M., Socher, G., Thurner, V. & Ottinger, S. (2025). Exploring the Role of Large Language Models as Artificial Tutors. In Proceedings of the *2025 IEEE Education Engineering Conference*. 10.1109/EDUCON62633.2025.11016571

2024 **Zönnchen, B.**, Thurner, V. & Böttcher, A. (2024). On the Impact of ChatGPTon Teaching and Studying Software Engineering. In Proceedings of the *2024 IEEE Education Engineering Conference*. 10.1109/EDUCON60312.2024.10578680

2024 **Zönnchen, B.**, Böhm, C. & Socher, (2024). Bridging disciplines in higher education: The convergence of AI and sustainability. In *Processings of the 10th International Conference on Higher Education Advances (HEAd'24)*., 10.4995/HEAd24.2024.17278

2024 Sanchez, T, **Zönnchen, B.**, Held, H., Dzhimova, M. & Socher (2024). Evaluating interdisciplinary and project-based learning on AI in culture and arts. In *EDULEARN24 Proceedings*, 10.21125/edulearn.2024.0757

2024 **Zönnchen, B.**, Böhm, C., von Schwichow, H., Socher & G., Wurster, S. (2024). Empowering interdisciplinary expertise: Evaluating the impact of challenge-based learning on AI and sustainability literacy in higher education. In *EDULEARN24 Proceedings*, 10.21125/edulearn.2024.1433

2024 Hammer, S., Ottinger, S., **Zönnchen, B.**, Hohendanner, M., Hobelsberger, M. & Thurner, V. (2024). ChatGPT in higher education: Perceptions of computer science-related students. In Proceedings of the *2024 IEEE Education Engineering Conference*. https://doi.org/10.1109/EDUCON60312.2024.10578742

2023 **Zönnchen, B.**, Friedrich, M. & Thurne V., (2023). Nachhaltigkeit in der informatischen Lehre am Beispiel KI. In *Tagungsband zum 5. Symposium zur Hochschullehre in den MINT-Fächern*, 10.57825/repo_in-4411

2022 Hammer, S., Ottinger, S., Thurner V. & **Zönnchen, B.**, (2022). Bonding in times of pandemia – a concept for purely virtual kick-off days to the student entry phase. In *Mobility for Smart Cities and Regional Development – Challenges for Higher Education*, 10.1007/978-3-030-93904-5_19

2020 **Zönnchen, B.**, & Köster, G., (2020). GPGPU computing for microscopic pedestrian simulation. In *Parallel Computing: Technology Trends*, 10.3233/APC200029

2020 **Zönnchen, B.**, Kleinmeier, B. & Köster, G., (2020). Vadere – a simulation framework to compare locomotion models. In *Traffic and Granular Flow 2019*, 10.1007/978-3-030-55973-1_41

2019 **Zönnchen, B.**, Kleinmeier, B., Gödel, M., & Köster, G., (2019). Vadere: an open-source simulation framework to promote interdisciplinary understanding. In *Collective Dynamics*, 4, 10.17815/CD.2019.21

2019 **Zönnchen, B.**, Laubinger, M., & Köster, G., (2019) Towards faster navigation algorithms on foor fields. In *Traffic and Granular Flow '17*, 10.1007/978-3-030-11440-4_34

2018 **Zönnchen, B.,** & Köster, G., (2018) A parallel generator for sparse unstructured meshes to solve the eikonal equation. In *Journal of Computational Science*, 10.1016/j.jocs.2018.09.009

2016 **Zönnchen, B.**, & Gerta Köster, (2016). Detecting arbitrarily shaped queues using the fast marching method. *8th International Conference on Pedestrian and Evacuation Dynamics*, Hefei, China

2015 Köster, G. & **Zönnchen, B.**, (2015). A queuing model based on social attitudes. In *Traffic and Granular Flow '15*, 10.1007/978-3-319-33482-0

2014 Köster, G., & **Zönnchen, B.**, (2014). Queuing at bottlenecks using a dynamic floor field for navigation. In *Transportation Research Procedia*, 10.1016/j.trpro.2014.09.029