Dr. Benedikt Zönnchen

Curriculum vitae

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BZoennchen

Academic education

03/2016 - 07/2020	*Technical University of Munich (TUM)*, Prof. Hans-Joachim Bungartz *Munich University of Applied Sciences (MUAS)*, Prof. Gerta Köster **Computer Science (Dr. rer. nat.)**, summa cum laude
PhD thesis	Efficient parallel algorithms for large-scale pedestrian simulation
10/2013 - 02/2016	*Technical University of Munich (TUM)*, **Computer Science (M. Sc.)**, Grade: 1.5
Master thesis	Implementation of an efficient equivalence test for sequential & linear tree-to-word transducers
10/2010 - 09/2013	*Munich University of Applied Sciences (MUAS)*, **Computer Science (B. Sc.)**, Grade: 1.17
Bachelor thesis	Navigation around pedestrian groups and queueing using a dynamic adaption of travelling times in the fast marching algorithm

Job history (non-academic)

02/2022 - today	**Educational-tech engineer**, *Munich University of Applied Sciences*
08/2020 - 01/2022	**Senior advisor for education in computer science**, *Munich University of Applied Sciences*
03/2011 - 10/2011	**Software developer (working student)**, *Prevero AG*
09/2008 - 07/2009	**Web developer**, *Nokia Siemens Networks GmbH & Co. KG*
09/2005 - 07/2008	**Software developer (education)**, *Siemens AG*

Practical experience

Software development / machine learning

Python	**Excellent knowledge**, Python developer since 2016 (NumPy, Pandas, Django, SciPy), scripting, trainer for Python, author of an open Python textbook
Java	**Excellent knowledge**, Java developer since 2006, main contributor to the open-source simulation framework Vadere, language of my education at Siemens and the bachelor program
OpenCL	**Very good knowledge**, GPU programming during my PhD project
PyTorch, Scikit-learn	**Good knowledge**, teaching, development of a melody generator (LSTM, Transformer)
JS, HTML, CSS, PHP	**Good knowledge**, contributor to a social media platform (1 year), p5.js visualizations
C/C++	**Good knowledge**, high performance computing during my PhD project
Database, SQL	**Good knowledge**, constant use during my work as software developer
PHP	**Basic knowledge**, contributor to a social media platform (1 year)
Rust, Scala, Haskell	**Basic knowledge**, personal interest

Other technologies

Git	**Excellent knowledge**, Git user since 2011
LaTeX	**Excellent knowledge**, LaTeX advocate since 2011
Jupyter ecosystem	**Very good knowledge**, deploayment of a JupyterHub, Development of Jupyter notebooks for my students, author of an interactive Jupyter book
SuperCollider	**Very good knowledg**, digital signal processing, sound design, live programming, SC-book
Docker	**Basic knowledge**, usage in the context of education

Academic interests

AI4all How can machine learning methods enhance the capability of action of the general public?

CreativeAI How can the intentionality of artists find expression through the use of generative methods of machine learning? Which methods are suitable and how can intentionality be better realized?

AI4S & SAI How can the methods of machine learning assist us in achieving sustainability goals, and to what extent do they endanger these goals? How can we reduce energy consumption during training and inference?

Other interests

Bildung Free and open education, schooling and education in the digital era

Complex systems How can large crowds be microscopically simulated in real-time? (Past research interest), Emergence in complex systems

Private interests

Philosophy Philosophy in films, phenomenology, construcivism, philosophy of mind

Creative Coding Live programming, algorithmic composition, sound design, generative design

Formal methods Automata theory, logic, online- and approximation algorithms

Teaching

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

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

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

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

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

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

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

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

Publications

2023 **Benedikt Zönnchen**, Markus Friedrich and Veronika Thurne, Nachhaltigkeit in der informatischen Lehre am Beispiel KI, In *Tagungsband des MINT-Symposiums*, Link

2022 Sabine Hammer, Sarah Ottinger, Veronika Thurner and **Benedikt Zönnchen**, 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 **Benedikt Zönnchen**, and Gerta Köster, GPGPU computing for microscopic pedestrian simulation, In *Parallel Computing: Technology Trends*, 10.3233/APC200029

2020 **Benedikt Zönnchen**, Benedikt Kleinmeier and Gerta Köster, Vadere – a simulation framework to compare locomotion models, In *Traffic and Granular Flow 2019*, 10.1007/978-3-030-55973-1_41

2019 **Benedikt Zönnchen**, Benedikt Kleinmeier, Marion Gödel and Gerta Köster, Vadere: an open-source simulation framework to promote interdisciplinary understanding, In *Collective Dynamics*, 4, 10.17815/CD.2019.21

2019 **Benedikt Zönnchen**, Matthias Laubinger and Gerta Köster, Towards faster navigation algorithms on foor fields, In *Traffic and Granular Flow '17*, 10.1007/978-3-030-11440-4_34

2018 **Benedikt Zönnchen** and Gerta Köster, A parallel generator for sparse unstructured meshes to solve the eikonal equation, In *Journal of Computational Science*, 10.1016/j.jocs.2018.09.009

2015 Gerta Köster and **Benedikt Zönnchen**, A queuing model based on social attitudes, In *Traffic and Granular Flow '15*, 10.1007/978-3-319-33482-0

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

2014 Gerta Köster and **Benedikt Zönnchen**, Queuing at bottlenecks using a dynamic floor field for navigation, In *Transportation Research Procedia*, 10.1016/j.trpro.2014.09.029

Scholarships & awards

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

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

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**