Dr. Thomas Lang

Curriculum Vitae

Personal Information

Born	**20th April 1993**, *Schärding*
Citizenship	**Austria**
Confession	**Roman catholic**

Education

PhD

04/01/2018 – 04/14/2021	**University of Passau**, *Computer Science*, Final grade 1.0 (*summa cum laude*)
07/09/2021	Thesis defence

Study

Term 2016/17–Term 2017/18	**University of Passau**, *Master Computer Science*, Final grade 1.1 (with distinction)
Term 2013/14–Term 2016	**University of Passau**, *Bachelor Computer Science*, Final grade 1.8 (good)

School

2012	**Matura**, *Average grade* 1.2 *(with distinction)*
2007–2012	**Höhere Technische Lehranstalt Innviertel-Nord in Andorf**
2003–2007	**Hauptschule Münzkirchen**
1999–2003	**Volksschule Münzkirchen**

PhD Thesis

Title	**AI-Supported Interactive Segmentation of 3D Volumes**
Description	Development of novel and general methods for interactive segmentation of very large 3D volumetric data using geometric information.
Download	https://nbn-resolving.org/urn:nbn:de:bvb:739-opus4-9221

Masters Thesis

Title	**Improving the Efficiency of Code Generation Based on Cylindrical Algebraic Decomposition**
Description	Implementation and optimization of code generation for arbitrary loop bounds based on a cylindrical algebraic decomposition.
Download	http://www.infosun.fim.uni-passau.de/cl/arbeiten/lang-m.pdf

Bachelors Thesis

Title	**An Intel®Xeon Phi™ Backend for the ExaStencils Code Generator**
Description	Extension of the ExaStencils code generator to support the Intel®Xeon Phi™ co-processor.
Download	http://www.infosun.fim.uni-passau.de/cl/arbeiten/lang-b.pdf

Language Skills

German	Native
English	Fluent
Russian	Fundamental

Presentations

C++ course	Presenter of a C++ course at the University of Passau, Winter terms 2018/19 and 2019/20
PhD	Several presentations throughout the doctorate
Rigorosum	PhD thesis defence presentation, 07/09/2021

Experience

Professional

09/01/2021 –	**Post-Doc**, *Fraunhofer IIS, Division EZRT/CTMT, Passau*
04/01/2018 – 08/31/2021	**Researcher**, *Institute FORWISS, University of Passau*
08/01/2016 – 03/31/2018	**Student researcher**, *Institute FORWISS, University of Passau*
2015/2016	**Student researcher**, *University of Passau, several chairs*
07–08 / {2011,2013}	**Summer job**, *GST Global Sports Technologies GmbH*

Additional Qualifications

- Extensive experience with programming in C/C++, Python, Haskell
- Extensive experience with parallel programming (OpenMP, MPI, GPU)
- Extensive experience with LaTeX
- Extensive experience with machine learning techniques and their usage
- Experience with version control software (git, svn)

Projects

Acquired projects

09/01/2021 – 08/31/2022	**OntoSeg**, *Efficient ontology-based segmentation of large volumes*, Budget: 90k€

Project work

01/01/2022 –	**QuaST**, *Quantum-enabling Services und Tools für industrielle Anwendungen*
01/01/2022 –	**QACI**, *Munich Quantum Valley - Quantum algorithms for application, cloud and industry*
01/01/2022 –	**BayQS**, *Research with applications of Quantum Computing*
03/01/2021 – 07/30/2021	**BM18**, *High resolution industrial tomography beamline for large objects*
04/01/2018 – 02/28/2021	**Big Picture**, *de.: Digitalisierung, Verarbeitung und Analyse kultureller und industrieller Objekte: Wertschöpfung aus großen Daten*

Awards and Certificates

11/11/2022	Dissertationspreis der Universität Passau - Dissertation price of the University of Passau
10/01/2019	iSAQB ® Certified Professional for Software Architecture - Foundation Level
05/22/2018	Professional Scrum Master I
01/26/2018	msg Price for exceptional study work

Military Service

Type	Community Service
Institution	Lebenshilfe Münzkirchen
Field of Work	Aiding the care of care-dependent persons
Duration	08/01/2012 to 04/30/2013

Hobbies and Interests

Computer Science	Interest in software development with focus on machine learning, programming languages and image processing
Genealogy	Creation of a genealogy of my family
Origami	Creation of complex origami figures
Calligraphy	Calligraphic writing, mostly in Kurrent

Publications

T. Lang and T. Sauer, "Geometric Active Learning for Segmentation of Large 3D Volumes," *arXiv*, 2022. doi:10.48550/ARXIV.2210.06885.

T. Lang and T. Sauer, "Feature-Adaptive Interactive Thresholding of Large 3D Volumes," *arXiv*, 2022. doi:10.48550/ARXIV.2210.06961.

R. Fischer, E. Hufnagel, T. Lang, J. Claußen, S. Gerth, and T. Sauer, "A Demonstrator for Threat Detection in Volumetric CT Scans," in *Proc. 12th Int. Conf. Ind. Comput. Tomogr.*, 2023.

T. Lang and A. M. Stock, "Interactive Denoising of 3D Volumes Using Wavelets," in *Proc. 12th Int. Conf. Ind. Comput. Tomogr.*, 2023.

T. Lang, N. Saeidnezhad, K. Dremel, D. Weller, M. Diez, A. M. Stock, T. Sauer, F. Cianciosi, C. Jarnias, P. Tafforeau, and S. Zabler, "Multiscale Phase-Contrast Tomography at BM18," in *Proc. 12th Int. Conf. Ind. Comput. Tomogr.*, 2023.

K. Semmler, Simon Dremel, D. Suth, T. Lang, M. Basting, M. Firsching, T. Fuchs, S. Kasperl, D. Prjamkov, M. Weule, and R. Schielein, "N-Dimensional Image Encoding on Quantum Computers," in *Proc. 12th Int. Conf. Ind. Comput. Tomogr.*, 2023.

T. Lang, "Clustering large 3D Volumes: A sampling-based approach," in *Proc. 59th Annu. Br. Conf. Non-Destr. Test.*, 2022.

T. Lang and T. Sauer, "AI-Supported Segmentation of Industrial CT Data," in *Proc. 11th Int. Conf. Ind. Comput. Tomogr.*, vol. 27, 2022.

T. Lang, *AI-Supported Interactive Segmentation of 3D Volumes*. PhD thesis, University of Passau, 2021. Available under `https://nbn-resolving.org/urn:nbn:de:bvb:739-opus4-9221`.

T. Lang and T. Sauer, "Feature-Adaptive Interactive Thresholding." Poster, presented at 31st Rhein-Ruhr-Workshop, Bestwig, 2022.

T. Lang and T. Sauer, "AI-Supported Segmentation of Industrial CT Data." Poster, presented at 31st Rhein-Ruhr-Workshop, Bestwig, 2022.

Scientific Activities

2022   Co-organizer of the 12th Int. Conf. on Industrial Computed Tomography (iCT 2023)

Münzkirchen, 26. Dezember 2022