

# Dr. Thomas Lang

## Curriculum Vitae

### Personal Information

Born **20<sup>th</sup> 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

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## Experience

### Professional

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

### Additional Qualifications

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

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## Projects

### Acquired projects

09/01/2021 – 05/31/2022	<b>OntoSeg</b> , <i>Efficient ontology-based segmentation of large volumes</i> , Budget: 90k€
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### Project work

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

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## Awards and Certificates

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

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## 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

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## 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

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## Publications

T. Lang and T. Sauer, “Feature-Adaptive Interactive Thresholding of Large 3D Volumes,” *J. Math. Imaging Vis.*, 2022. submitted for publication.

R. Fischer, E. Hufnagel, T. Lang, J. Claußen, S. Gerth, and T. Sauer, “A Demonstrator for Threat Detection in Volumetric CT Scans,” in *Proceedings of the 12th Confernece on Industrial Computed Tomography*, 2022. submitted for publication.

T. Lang and T. Sauer, “AI-Supported Segmentation of Industrial CT Data,” in *Proceedings of the 11th Conference on Industrial Computed Tomography*, vol. 27, 2022.

T. Lang, “Clustering large 3D Volumes: A sampling-based approach,” in *Proceedings of the 59th Annual British Conference on Non-Destructive Testing*, 2022. accepted for publication.

T. Lang and A. M. Stock, “Interactive Denoising of 3D Volumes Using Wavelets,” in *Proceedings of the 12th Confernece on Industrial Computed Tomography*, 2022. submitted for publication.

S. Zabler, N. Saeidnezhad, M. Diez, T. Lang, A. M. Stock, T. Sauer, and P. Tafforeau, “Multiscale Phase-Contrast Tomography at BM18,” in *Proceedings of the 12th Confernece on Industrial Computed Tomography*, 2022. submitted for publication.

S. Semmler, D. Suth, K. Dremel, M. Basting, M. Firsching, T. Fuchs, S. Kasperl, T. Lang, D. Prjamkov, R. Schielein, and M. Weule, “N-Dimensional Image Encoding on Quantum Computers,” in *Proceedings of the 12th Confernece on Industrial Computed Tomography*, 2022. submitted for publication.

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## Scientific Activities

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