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Dr. Tessa Nogatz

Personal Details

Name	Tessa Nogatz
Date of Birth	24/5/1993
Place of Birth	Gehrden (Hannover), Germany

Education

10/2018–12/2022 **Dr. rer. nat. Mathematics**, *Technische Universität Kaiserslautern*, Germany
Overall Grading: With distinction – summa cum laude
Title of dissertation: "Estimation of Motion Vector Fields of Complex Microstructures by Time Series of Volume Images," supervised by Prof. Dr. Claudia Redenbach (TU Kaiserslautern) and Dr. Katja Schladitz (Fraunhofer ITWM Kaiserslautern)

04/2016–10/2018 **M.Sc. Mathematics**, *Universität Würzburg*, Germany
Overall Grading: 1.1 with distinction
Master Thesis "Reconstruction of the lung during free breathing in Magnetic Resonance Imaging," supervised by Prof. Dr. Bernadette Hahn-Rigaud

10/2015–01/2016 **M.Sc. Mathematics**, *Technische Universität Berlin*, Germany
Switch to Universität Würzburg with summer term 2016

2011–2015 **B.Sc. Mathematics**, *Technische Universität Berlin*, Germany
Overall Grading: 2.8
Bachelor Thesis "Backward error analysis and long-term energy conservation of symplectic integrators," supervised by Prof. Dr. Yuri B. Suris

2004–2011 **Abitur**, *"Matthias-Claudius"-Gymnasium Gehrden (Hannover)*, Germany
Overall Grading: 2.2

Work Experience

Since 07/2024 **Software Developer**, *MetaSystems GmbH, Altlußheim*
Frontend, backend and algorithm development for automated microscopy

01/2023–06/2024 **Postdoc**, *RPTU Kaiserlautern-Landau*
Postdoc at Chair for Statistics with Prof. Dr. Claudia Redenbach
Analysis of failure mechanisms of composite materials based on large scale CT data
Teaching assistent for lectures on "Higher Mathematics for Engineers"
Classification of lung tissue based on CT and Synchrotron image data

08/2021–12/2022 **Scientific Assistant**, *TU Kaiserslautern*
Scientific Assistant at Chair for Statistics with Prof. Dr. Claudia Redenbach
Teaching assistent for lectures on "Stochastic Methods" and "Regression and Time Series Analysis"

03/2021–08/2021 **Scientific Assistant**, *Fraunhofer-Institut für Techno- und Wirtschaftsmathematik, Abteilung für Bildverarbeitung, Kaiserslautern*
Development & implementation of algorithms for defect detection on industrial surfaces

10/2018–02/2021 **PhD Scholar**, *Fraunhofer-Institut für Techno- und Wirtschaftsmathematik, Abteilung für Bildverarbeitung, Kaiserslautern*

12/2017–09/2018 **Working student software development**, *InstruNEXT GmbH, Würzburg*
Development & implementation of computer vision algorithms

03/2016–11/2017 **Working student software developement**, *stroemtec GmbH, Würzburg*
Development & implementation of CAD/CAM algorithms

07/2015–03/2016 **Working student software developement**, *compuccino GmbH, Berlin*
Backend development of information dashboards

03/2012–07/2015 **Online-Tutor**, *Integral Learning GmbH, Berlin*

Technical Skills

Mathematical **Inverse Problems, Calculus of Variations, Numerics, Data Science**
Languages **Python, Delphi, C++, Matlab, R**
Versioning **Git, Mercurial, Subversion**

Languages

German Mother tongue
English **Fluent**, *in speech and writing*

Volunteer Work

2013–2018 **Niedersächsische Schachjugend**
Vice Chair

2009–2014 **Schachjugend im Schachbezirk Hannover**
Designee for Girls in Chess

Scientific Service

2023 **Session Chair**, *12th International Conference on Industrial Computed Tomography (iCT 2023)*

2022 **Journal Reviewer**, *Journal for Composite Materials*, 2022

2018–2022 **Student member in PhD committee**, *TU Kaiserslautern*
Committee for admission and organization of PhD students at TU Kaiserslautern

2018 **Student member in PhD guidelines committee**, *TU Kaiserslautern*
Committee for redrafting PhD guidelines in Mathematics Department

Funding and Awards

2023 **Award**, *Freundeskreis der RPTU Kaiserslautern e.V. for outstanding dissertations*

2022 **Funding**, *Post Doc Funding for early stage researchers in AI from University of Kaiserslautern*

Conferences and Invited Talks

2023 **Invited Talk**, *TU Braunschweig*, Prof. Dirk Lorenz, Insitut für Analysis
Estimation of Motion Vector Fields of Complex Microstructures by Time Series of Volume Images

2023 **Conference**, *Image Based Simulation for Industry*, London, UK
Validation and Verification of Motion Estimation in In Situ Tests

2023 **Invited Talk**, *University of Antwerp*, Prof. Jan Sijbers
Estimation of Motion Vector Fields of Complex Microstructures by Time Series of Volume Images

2023 **Conference**, *20th International Conference of Applied Mechanics*, Porto, Portugal
Assessing Cracks in Concrete by a Fast and Efficient Motion Estimation Algorithm

2023 **Conference**, *12th International Conference on Computed Tomography*, Fürth
Ex- and in-situ tests of materials: From design to materials parameters

2022 **Conference**, *Annual DIC Conference*, Boston, USA
3D Optical Flow - a Novel Approach to Motion Estimation in In-Situ Mechanical Tests

2022 **Conference**, *92nd GAMM Annual Meeting*, Aachen, Germany
Early stage failure identification in compression experiments of foam-like structures

2022 **Conference**, *15th International ACEX Conference*, Florence, Italy
Crack Detection in CT Images of an In-Situ Compressed Concrete Sample

2019 **Conference**, *4th ICTMS*, Cairns, Australia
In-situ Testing with Diffeomorphic Mapping

Publications

Sophie Klemm, **Tessa Nogatz**, Jonathan Perrin, Timm Weitkamp, Claudia Redenbach, and Claudia Fleck. "Synchrotron phase-contrast enhanced computed microtomography *in-situ* compression on *F. fomentarius* evaluated by 3D optical flow." In: *Small Structures, submitted* (2024).

Tessa Nogatz, Claudia Redenbach, and Katja Schladitz. "MorphFlow: Estimating Motion in In Situ Tests of Concrete." In: *Experimental Mechanics* (2024).

Tessa Nogatz, Anne Jung, Tomáš Fíla, Ivana Kumpová, and Ondřej Jiroušek. "Analysis of the Meso-Mechanical Deformation Behavior of Al Foams and Ni/Al Hybrid Foams Using Time-Lapse Micro-Computed Tomography Measurements and 3D Optical Flow." In: *Advanced Engineering Materials* (2024).

Tessa Nogatz, Anna Nowacka, Claudia Redenbach, and Katja Schladitz. "Assessing cracks in 3D images of concrete by a fast and efficient motion estimation algorithm." In: *20th ICEM*. 2023.

Tessa Nogatz, Claudia Redenbach, and Katja Schladitz. "3D optical flow for large CT data of materials microstructures." In: *Strain* 58.3 (2022), e12412.

Tessa Nogatz, Claudia Redenbach, and Katja Schladitz. "Ex and in situ tests of materials: From design to materials parameters via motion estimation." In: *12th iCT*. 2022.

Tessa Kuschnerus, Claudia Redenbach, Katja Schladitz, Thomas Wagner, and Friedrich Zerling. "In-situ testing with diffeomorphic mapping." In: *4th ICTMS*. 2019.