

# Mario Teixeira Parente

## Curriculum Vitae

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### Experience

- 10/2024 – today *Pforzheim University*  
**Professor of Mathematics (W2)**  
Teaching and research in applied mathematics
- 04/2024 – 09/2024 *Entrix GmbH*  
**Senior Data Scientist**  
Optimization, time series analysis
- 10/2023 – 03/2024 *Ludwig-Maximilians-Universität München (LMU)*  
**Interim Professor for Computational Statistics and Data Science (W2)**  
Advanced mathematical methods in statistics (German),  
Optimization in Machine Learning (English)
- 03/2021 – 09/2023 *University of Applied Sciences Munich (HM)*  
**Lecturer**  
Uncertainty Quantification (English), Linear Algebra (German)
- 10/2020 – 09/2023 *Jülich Centre for Neutron Science (JCNS)*  
**Postdoctoral researcher**  
Machine learning-based data acquisition of neutron experiments
- 10/2016 – 09/2020 *Technical University of Munich (TUM)*  
**Scientific employee**  
Research and teaching in applied mathematics

### Education

- 10/2016 – 09/2020 *Technical University of Munich (TUM)*  
**Mathematics (Dr. rer. nat.)**  
PhD Thesis Active Subspaces in Bayesian Inverse Problems
- 10/2013 – 04/2016 *Ludwig-Maximilians-Universität München (LMU)*  
**Mathematics (M.Sc.)**  
Master Thesis Brownian Motion and the Dirichlet Problem
- 10/2010 – 09/2013 *University of Applied Sciences Munich (HM)*  
**Scientific Computing (B.Sc.)**  
Bachelor Thesis N.V. Krylov's Proof of the de Moivre-Laplace Theorem

### Scholarships

- 04/2012 – 05/2016 **German Academic Scholarship Foundation** (Studienstiftung des deutschen Volkes)
- 04/2012 – 04/2016 **Max Weber Program** (Max Weber-Programm Bayern)
- 10/2011 – 03/2012 **Deutschlandstipendium**

### Volunteering

- 10/2021 – now **Mentor for the Max Weber Program.** Supervision of scholarship holders. Munich
- 2016 – now **Committee member for admissions seminars of the German Academic Scholarship Foundation.** Evaluation of personal interviews and group discussions. Germany
- 03/2015 – 02/2016 **Volunteer at Salesianum München.** Support for refugees and other disadvantaged young people

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## Teaching

Winter 2024/25	<b>Linear Algebra 1</b> (German). <i>Professor.</i> HSPF
Winter 2024/25	<b>Mathematics 1</b> (for Engineers) (German). <i>Professor.</i> HSPF
Winter 2024/25	<b>Programming in Python</b> (German). <i>Professor.</i> HSPF
Winter 2023/24	<b>Advanced mathematical methods in statistics</b> (German). <i>Interim Professor.</i> LMU
Winter 2023/24	<b>Optimization in Machine Learning</b> (English). <i>Interim Professor.</i> LMU
Summer 2023	<b>Fundamentals of Uncertainty Quantification</b> (English). <i>Lecturer.</i> HM
Winter 2022/23	<b>Linear Algebra</b> (German). <i>Lecturer.</i> HM
Summer 2022	<b>Fundamentals of Uncertainty Quantification</b> (English). <i>Lecturer.</i> HM
Winter 2021/22	<b>Linear Algebra</b> (German). <i>Lecturer.</i> HM
Summer 2021	<b>Fundamentals of Uncertainty Quantification</b> (English). <i>Lecturer.</i> HM
Summer 2020	<b>Mathematical Models for UQ in Hydrology</b> (English). <i>Module construction.</i> TUM
Winter 2019/20	<b>Introduction to Numerical Linear Algebra</b> (German). <i>Exercise coordinator.</i> TUM
Summer 2019	<b>Numerics of PDEs for Engineers</b> (German). <i>Exercise coordinator.</i> TUM
Winter 2018/19	<b>Modeling and Simulation with ODEs</b> (German). <i>Tutor.</i> TUM
Summer 2018	<b>Numerics of ODEs</b> (German). <i>Tutor.</i> TUM
Winter 2017/18	<b>Introduction to Numerical Linear Algebra</b> (German). <i>Tutor.</i> TUM
Summer 2017	<b>Introduction to Programming</b> (German). <i>Tutor.</i> TUM
Summer 2017	<b>Seminar: UQ with Efficient Monte Carlo Methods</b> (English). TUM
Winter 2015/16	<b>Stochastics</b> (German). <i>Tutor.</i> LMU
Winter 2014/15	<b>Analysis I</b> (German). <i>Tutor.</i> LMU
Winter 2011/12	<b>Linear Algebra</b> (German). <i>Tutor.</i> HM
Winter 2011/12	<b>Software Engineering</b> (German). <i>Tutor.</i> HM

## Certificates

2017 – 2019	<b>Certificate for Teaching in Higher Education of the Bavarian Universities.</b> <i>Advanced level.</i> TUM ProLehre
2017 – 2019	<b>Certificate for Teaching in Higher Education of the Bavarian Universities.</b> <i>Introductory level.</i> TUM ProLehre

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## Journal articles

- 2023 **TP., M.,** Brandl, G., Franz, C., Stuhr, U., Ganeva, M. & Schneidewind, A., (2023). Active learning-assisted neutron spectroscopy with log-Gaussian processes. *Nature Communications* **14**, 2246. doi: [10.1038/s41467-023-37418-8](https://doi.org/10.1038/s41467-023-37418-8)
- 2022 **TP., M.,** Schneidewind, A., Brandl, G., Franz, C., Noack, M., Boehm, M., & Ganeva, M. (2022). Benchmarking autonomous scattering experiments illustrated on TAS. *Frontiers in Materials* **8**, 772014. doi: [10.3389/fmats.2021.772014](https://doi.org/10.3389/fmats.2021.772014)
- 2020 **TP., M.,** Wallin, J., & Wohlmuth, B. (2020). Generalized bounds for active subspaces. *Electronic Journal of Statistics* **14**(1), 917–943. doi: [10.1214/20-EJS1684](https://doi.org/10.1214/20-EJS1684)
- 2020 Bittner, D., **TP., M.,** Mattis, S., Wohlmuth, B., & Chiogna, G. (2020). Identifying relevant hydrological and catchment properties in active subspaces: An inference study of a lumped karst aquifer model. *Advances in Water Resources* **135**, 103472. doi: [10.1016/j.advwatres.2019.103472](https://doi.org/10.1016/j.advwatres.2019.103472)
- 2019 **TP., M.,** Bittner, D., Mattis, S., Chiogna, G., & Wohlmuth, B. (2019). Bayesian calibration and sensitivity analysis for a karst aquifer model using active subspaces. *Water Resources Research* **55**(8), 7086–7107. doi: [10.1029/2019WR024739](https://doi.org/10.1029/2019WR024739)
- 2019 **TP., M.,** Mattis, S., Gupta, S., Deusner, C., & Wohlmuth, B. (2019). Efficient parameter estimation for a methane hydrate model with active subspaces. *Computational Geosciences* **23**(2), 355–372. doi: [10.1007/s10596-018-9769-x](https://doi.org/10.1007/s10596-018-9769-x)

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## Conferences / Talks

- 06/2023 **Helmholtz AI Conference 2023.** *Active learning-assisted neutron spectroscopy with log-Gaussian processes.* Helmholtz AI, Helmholtz Association

- 04/2023 **Machine Learning Workshop.** *Active learning-assisted neutron spectroscopy with log-Gaussian processes.* Lawrence Berkeley National Laboratory
- 03/2023 **ECNS 2023.** *AI-assisted neutron spectroscopy - Log-Gaussian processes for TAS.* Heinz Maier-Leibnitz Zentrum
- 10/2022 **JCNS Workshop** (invited talk). *AI-assisted neutron spectroscopy - Log-Gaussian processes for TAS.* Jülich Centre for Neutron Science
- 12/2021 **MLZ User Meeting.** *Benchmarking autonomous TAS experiments.* Heinz Maier-Leibnitz Zentrum
- 11/2021 **Workshop on SAXS@XFELs and HI & HE laser driven matter.** *Benchmarking autonomous TAS experiments.* Helmholtz-Zentrum Dresden-Rossendorf
- 10/2021 **Workshop on Innovative Inelastic Neutron Scattering.** *Benchmarking autonomous scattering experiments illustrated on TAS.* Institut Laue-Langevin
- 02/2021 **Workshop on Autonomous Discovery in Science and Engineering.** *Autonomous Experiments for Neutron Three-Axis Spectrometers (TAS) with Log-Gaussian Processes.* Center for Advanced Mathematics for Energy Research Applications, Lawrence Berkeley National Laboratory
- 03/2020 **SIAM UQ 2020.** *Solving a Bayesian Inverse Problem for a Karst Aquifer Model with Active Subspaces.* Garching (canceled due to outbreak of SARS-CoV-2)
- 05/2019 **Statistics Seminar.** *Active subspaces in Bayesian inverse problems.* Department of Statistics, Lund University
- 03/2018 **M2 Oberseminar.** *Active subspaces for Bayesian inversion, Application for a methane hydrate model.* Garching

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## Awards / Prizes

- 12/2023 **Helmholtz AI Award.** Best Paper 2023

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## Trainings

- 03/2017 **Parallel Programming of High Performance Systems.** Leibniz Computing Centre (LRZ)
- 02/2017 **Advanced C++ with Focus on Software Engineering.** Regionales RechenZentrum Erlangen (RRZE)

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## Other experiences

- 05/2019 **Research stay abroad.** Department of Statistics, Lund University. Topic: Theory of active subspaces
- 02/2019 – 03/2018 **Research stay abroad.** University of Texas at Austin (UT). Project: UNcertainties due to boundary conditions in predicting MIXing in groundwater (UNMIX)
- 06/2016 – 09/2016 **Student assistant.** HM. Project: Modeling and simulation of pedestrian movement
- 04/2016 – 05/2016 **Research internship.** Yale University (USA). Topic: Image processing of nanoscopic images in cell biology
- 10/2012 – 11/2013 **Student assistant.** HM. Project: Modeling and simulation of pedestrian movement

Kirchheim b. München, October 27, 2024