# Teresa Klatzer, BSc MSc

## Personal Information


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## Education

2021–2025 **PhD in Applied and Computational Mathematics**, *University of Edinburgh*, Scotland, UK.
Supervisors: Dr. Konstantinos Zygalakis and Dr Yoann Altmann, Research project: "Bayesian computation for low-photon imaging"

2015–2017 **PhD in Computer Science**, *TU Graz*, Austria, unfinished.
Vision, Learning and Optimization Group, Supervisor: Prof. Thomas Pock, Research project: "Deep variational networks for low-level computer vision"

2012–2014 **Master's degree in Telematics**, *TU Graz*, Austria, With Distinction.
Majors in Computational Intelligence and Software Technology
Master's thesis: "Bi-level Optimization for Support Vector Machines", Supervisor: Thomas Pock

2008–2012 **Bachelor's degree in Telematics**, *TU Graz*, Austria.
Interdisciplinary study: Information technology, electrical engineering, computer science

9/2011–2/2012 **Erasmus Program**, *Université Lille 1 Science et Technologies*, France.

2000–2008 **Secondary School**, Kapfenberg, Austria.
High school diploma with distinction, English immersion program

## Professional Experience

2021–current **Tutor**, *University of Edinburgh*.
Subjects: Machine Learning in Python, Calculus, Linear Algebra, Differential Equations

2020–2021 **Product Owner and Agile Coach**, *Black Tusk GmbH*, Graz, Austria.
Project lead for several (medical) software products, portfolio management, customer interviews and requirement engineering, general management and regulatory affairs for medical devices.

9/2018–5/2020 **Product Owner**, *Denovo GmbH*.
Project lead for several digitization projects, responsibility for product backlog and maximisation of business value, mediation between scrum team and clients, active management of client relations, business development, team development.

1/2018–8/2018 **Project Manager for Digital Business Solutions**, *Scoop & Spoon GmbH*, Graz, Austria.
Project lead for digital products, responsibility for budget, time, project quality and controlling, mediation between teams and all stakeholders.

7/2014–9/2017 **University Assistant**, *Institute of Computer Graphics and Vision, TU Graz*.
Team member of the Vision, Learning and Optimization Group, led by Prof. Thomas Pock. Research topics: Variational networks, deep regularization, convex and non-convex optimization and deep learning, learning activation functions, bi-level optimization, algorithm unrolling, applications to standard inverse imaging problems, joint denoising and demosaicing or super-resolution problems, joint reconstruction and classification problems, medical image reconstruction problems

2010–2015 **Teaching Assistant**, *TU Graz*.
Subjects: Convex Optimisation, Analysis, Computer and communication networks

## Skills and Expertise

Research Computational Statistics, Machine Learning, Neural Networks, Optimisation, Mathematical Imaging, Inverse Problems, Probabilistic Methods, Uncertainty Quantification

Programming Python, Matlab, C++, C, CUDA, Java

Frameworks Pytorch, Tensorflow, OpenCV, Hadoop

Management Agile software development, Scrum

## Summer Schools and Student Projects

04/2023 **Spring school (invited): Data-driven Inverse Problems in Biomedical Imaging**, Bonn, Germany.

08/2022 **Summer school: Quantifying Uncertainty: Prediction and Inverse Problems**, *Radboud University*, Nijmegen, The Netherlands.

7/2015 **Machine Learning Summer School**, *Max Planck Institute for Intelligent Systems Tübingen*, Germany.

8/2016 **Summer School on Mathematical and Numerical Methods in Image Processing**, *Berlin Mathematical School*, Germany.

2/2013–7/2013 **Student project**, *Institute for Theoretical Computer Science, TU Graz*, Austria.
Topic: *"State Estimation with Recurrent Neural Networks"*, Supervisor: Robert Legenstein

9/2011–2/2012 **Student project**, *INRIA, Lille*, France.
Topic: "Map Reduce Programming for Machine Learning Algorithms on Graphs", Supervisors: Marc Tommasi and Gemma C. Garriga

## Honors and Awards

2024 **SIAM Travel Award**, *SIAM Conference on Imaging Science*, Atlanta, USA.

2023-2024 **Laura Wisewell Travel Scholarships**, *to attend SIAM IS and the spring school in Bonn*.

2017 **Best Paper Award**, *German Conference on Pattern Recognition 2017*, Basel, Switzerland.
Paper title: "Variational Networks: Connecting Variational Methods and Deep Learning"

2015 **Best Paper Award**, *Computer Vision Winter Workshop 2015*, Seggau, Austria.
Paper title: "Continuous Hyper-parameter Learning for Support Vector Machines"

2012 **Scholarship of Excellence**, *TU Graz*.

## Language skills

Languages **German** (native), **English** (fluent), **French** (fluent), **Spanish** (basic), **Italian** (basic)

## Other Competences

2023–current **Committee member of Piscopia**, Edinburgh, UK.
Activities supporting women and non-binary students doing PhDs in Mathematics

2020–2021 **Co-founder of a Youtube channel**, *"Warum nicht leicht"*, Graz, Austria.
Production of educational videos and other content about personal development

2018–2020 **Life coaching and Counselling training**, *Balanceakademie*, Graz, Austria.

2019 **Executive coaching project**, Graz, Austria.
Development and execution of a coaching programme for executives in a large banking company during a company-wide change project, project lead.

2018 **Founding member of a dance association**, *Salsativity.org*, Graz, Austria.

## Talks

06/2024 Invited Talk "Bayesian Computation with Plug and Play Priors for Poisson Inverse Problems" at the ICMS workshop "New Directions for Stochastic Differential Equations and Machine Learning", in Edinburgh, UK

05/2024 Invited Talk at the mini-symposium "Deep Unrolled Optimisation Methods for Inverse Imaging Problems" at SIAM IS in Atlanta, USA, title: "Bayesian Computation with Plug and Play Priors for Poisson Inverse Problems"

02/2024 Invited Talk in the mini-symposium "Advances in Bayesian Inverse Problems" at SIAM UQ in Trieste, Italy, title: "Accelerating MCMC for UQ in Imaging Science by Relaxed Proximal-point Langevin Sampling"

09/2023 Contributed Talk: "Accelerating MCMC for imaging science by using an implicit Langevin algorithm" at the conference of Applied Inverse Problems in Goettingen, Germany

05/2017 Invited Talk in the mini-symposium "Non-standard regularisation: theory and applications" at the conference of Applied Inverse Problems in Hangzhou, China, title: "Deep Regularization"

02/2017 Invited talk at the interdisciplinary data science workshop "Mathematical imaging with partially unknown models" in Cambridge, UK, title: "Learning Variational Networks for Solving Inverse Problems in Imaging"

05/2016 Oral at the International Conference on Computational Photography, Chicago, USA, title: "Joint Demosaicing and Denoising Based on Sequential Energy Minimization"

02/2015 Oral at the Computer Vision Winter Workshop, Seggau, Austria, title: "Continuous Hyper-parameter Optimization for Support Vector Machines"

## Publications


Teresa Klatzer, Paul Dobson, et al. "Accelerated Bayesian imaging by relaxed proximal-point Langevin sampling". In: *SIAM Journal on Imaging Sciences* 17.2 (2024), pp. 1078–1117.

Alexander Effland, Teresa Klatzer, et al. "Variational Networks for Joint Image Reconstruction and Classification of Tumor Immune Cell Interactions in Melanoma Tissue Sections". In: *Bildverarbeitung für die Medizin*. 2018.

Kerstin Hammernik, Teresa Klatzer, et al. "Learning a Variational Network for Reconstruction of Accelerated MRI Data". In: *Magnetic Resonance in Medicine*. 2018.

Teresa Klatzer, Daniel Soukup, et al. "Trainable Regularization for Multi-frame Superresolution". In: *Proceedings of the German Conference on Pattern Recognition*. 2017.

Erich Kobler, Teresa Klatzer, et al. "Variational Networks: Connecting Variational Methods and Deep Learning". In: *Proceedings of the German Conference on Pattern Recognition*. 2017.

Teresa Klatzer, Kerstin Hammernik, et al. "Joint Demosaicing and Denoising Based on Sequential Energy Minimization". In: *Proceedings of the International Conference on Computational Photography*. 2016.

Teresa Klatzer and Thomas Pock. "Continuous Hyper-parameter Optimization for Support Vector Machines". In: *Proceedings of the 20th Computer Vision Winter Workshop*. 2015.


Edinburgh, UK, 21/09/2024