Maximilian **Bernkopf**

MATH GEEK · DATA NERD

maximilianbernkopf@gmail.com maximilianbernkopf.github.io/data/ MaximilianBernkopf
maximilianbernkopf Google Scholar

Summary

Max is pursuing his PhD in computational mathematics at the TU Wien focussing on the numerics of time-harmonic wave propagation problems. Besides mathematics, he is a true data nerd. He loves handling and visualizing big data sets and discovering the unique stories they can tell. His languages of choice are R and Python, depending on the task at hand. He gained his data science experience working at start-ups in Vienna, where he solved problems involving time series analysis and outlier detection.

Education

PhD Candidate in Computational Mathematics — *Vienna, Austria*

TU Wien — *09/2017-current*

- Doctoral thesis: ”Finite Element Analysis of the Heterogeneous Helmholtz Equation and Least Squares Methods”
- Supervisor: Prof. Jens Markus Melenk, PhD

Dipl.-Ing. (equivalent MSc) in Financial and Actuarial Mathematics — *Vienna, Austria*

TU Wien — *11/2015-06/2016*

- Master thesis: ”Analysis of the alpha-hypergeometric stochastic volatility model”
- Supervisor: Prof. Dr. Stefan Gerhold

BSc in Financial and Actuarial Mathematics — *Vienna, Austria*

TU Wien — *07/2011-11/2015*

Matura (High school graduation equivalent) — *Vienna, Austria*

Schottengymnasium — *10/2002-06/2010*

Work Experience

Data Scientist — *Vienna, Austria*

IntraBase — *09/2016-09/2017*

- Focus on statistical learning and outlier detection.
- Development of statistical algorithms for unsupervised outlier detection.
- High dimensional anomaly detection of categorical and numerical data.

Data Scientist — *Vienna, Austria*

Mantigma — *08/2016-09/2017*

- Focus on time series analysis and supervised learning.
- Account balance forecasting for retail banking.
- Electricity demand forecasting utilizing classical mathematical time series models as well as novel deep learning techniques.
- Machine learning based credit scoring models.

Research Assistant — *Vienna, Austria*

TU Wien, Research Unit of Financial and Actuarial Mathematics — *10/2015-06/2016*

- Focus on credit risk models and their implementation.

Internship — *Vienna, Austria*

FMA Finanzmarktaufsicht Österreich — *09/2013-12/2013*

- Focus on Solvency II.

Community Service / Paramedic — *Vienna, Austria*

Arbeiter-Samariter-Bund — *12/2010-08/2011*

Skills

R	tidyverse (dplyr, ggplot2, tibble, purrr, readr etc.), dbplyr, data.table, shiny, forecast, caret, tidymodels, plotly, rmarkdown
Python	ngsolve, numpy, pandas, matplotlib, scipy, sklearn
Proficient in	Matlab, Mapel, Mathematica, LaTex
Basic Knowledge of	Hugo, C, C++, Java
Languages	German (native), English (fluent), Russian (basic)
Operating System of Choice	Linux + i3wm

Hobbies and Random Bits

Sports	Calisthenics, Climbing, Bouldering, Gymnastics & Acrobatics
Non-athletic Hobbies	Dancing, Reading stoic philosophy, Non-modern Art, Listening to audiobooks at 2x the speed
Less Usefull Skills	Juggeling, Yoyo-tricks, Solving the Rubiks cube
Guilty Pleasures	Selfimporvement books, Reddit, Memes, Cheese
Random Facts	Can fit at least three Soletti sideways in his mouth, Dyed his hair blond to be Son Goku for Halloween, Google Local Guide Level 7, Weirdly enthusiastic about his Dyson

Teaching

Tutor - Analysis 1-3, Computer Mathematics — *Vienna, Austria*
TU Wien, Institute of Analysis and Scientific Computing — *2015-2021*

Seminar Instructor - Seminar on inverse problems — *Vienna, Austria*
TU Wien, Institute of Analysis and Scientific Computing — *03/2019–07/2019*

Seminar Instructor - Seminar on uncertainty quantification and approximation theory of neural networks — *Vienna, Austria*
TU Wien, Institute of Analysis and Scientific Computing — *10/2018–02/2019*

Research Stays

Université Polytechnique Hauts-de-France — *Valenciennes, France*
working with Prof. Dr. Serge Nicaise — *09/2020-12/2020*

Universität Zürich — *Zürich, Switzerland*
working with Prof. Dr. Stefan Sauter — *09/2019-12/2019*

Publications

[5] Wavenumber-explicit stability and convergence analysis of hp Finite Element discretizations of Helmholtz problems in piecewise smooth media, in preparation
M. Bernkopf, T. Chaumont-Frelet, J. M. Melenk
2021

[4] Optimal convergence rates in L^2 for a first order system least squares finite element method. Part II: inhomogeneous boundary conditions, in preparation
M. Bernkopf, J. M. Melenk
2021

[3] Solvability of Discrete Helmholtz Equations, submitted
M. Bernkopf, S. Sauter, C. Torres, A. Veit
arXiv e-prints arXiv:2105.02273, 2021

[2] Optimal convergence rates in L^2 for a first order system least squares finite element method. Part I: homogeneous boundary conditions, submitted
M. Bernkopf, J. M. Melenk
arXiv e-prints arXiv:2012.12919, 2020

[1] Analysis of the hp-Version of a First Order System Least Squares Method for the Helmholtz Equation
M. Bernkopf, J. M. Melenk
Advanced Finite Element Methods with Applications: Selected Papers from the 30th Chemnitz Finite Element Symposium 2017, 2019