



Maximilian Bernkopf

✉ maximilianbernkopf@asc.tuwien.ac.at

🏠 maximilianbernkopf.github.io/math/

📺 MaximilianBernkopf

🌐 maximilianbernkopf

🎓 Google Scholar

Summary

I am a project assistant and PhD candidate under the supervision of Jens Markus Melenk in the doctoral program Dissipation and Dispersion in Nonlinear PDEs funded by the FWF at TU Wien.

My research interest is concerned with numerical discretizations of time-harmonic wave propagation problems in a high frequency regime as well as least squares finite element methods with focus on minimal regularity assumptions on the data.

Besides that and due to my financial mathematics background I am interested in the connection to stochastics. Further interests of mine are the broad field of data science and machine learning. I gained my initial data science experience working at start-ups in Vienna.

Education

PhD Candidate in Computational Mathematics

TU WIEN

Vienna, Austria

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

TU WIEN

Vienna, Austria

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

TU WIEN

Vienna, Austria

07/2011-11/2015

Matura (High school graduation equivalent)

SCHOTTENGYMNASIUM

Vienna, Austria

10/2002-06/2010

Work Experience

Data Scientist

INTRABASE

Vienna, Austria

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

MANTIGMA

Vienna, Austria

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

TU WIEN, RESEARCH UNIT OF FINANCIAL AND ACTUARIAL MATHEMATICS

Vienna, Austria

10/2015-06/2016

- Focus on credit risk models and their implementation.

Internship

FMA FINANZMARKTAUFSICHT ÖSTERREICH

Vienna, Austria

09/2013-12/2013

- Focus on Solvency II.

Community Service / Paramedic

ARBEITER-SAMARITER-BUND

Vienna, Austria

12/2010-08/2011

Research Stays

Université Polytechnique Hauts-de-France

WORKING WITH PROF. DR. SERGE NICAISE

Valenciennes, France

09/2020-12/2020

Universität Zürich

WORKING WITH PROF. DR. STEFAN SAUTER

Zürich, Switzerland

09/2019-12/2019

Teaching

Tutor - Analysis 1

TU WIEN, INSTITUTE OF ANALYSIS AND SCIENTIFIC COMPUTING

Vienna, Austria

03/2021-current

Seminar Instructor - Seminar on inverse problems

TU WIEN, INSTITUTE OF ANALYSIS AND SCIENTIFIC COMPUTING

Vienna, Austria

03/2019-07/2019

Seminar Instructor - Seminar on uncertainty quantification and approximation theory of neural networks

TU WIEN, INSTITUTE OF ANALYSIS AND SCIENTIFIC COMPUTING

Vienna, Austria

10/2018-02/2019

Tutor - Analysis 1-3

TU WIEN, INSTITUTE OF ANALYSIS AND SCIENTIFIC COMPUTING

Vienna, Austria

10/2017-02/2019

Tutor - Computer Mathematics

TU WIEN, INSTITUTE OF ANALYSIS AND SCIENTIFIC COMPUTING

Vienna, Austria

03/2016-07/2016

Tutor - Computer Mathematics

TU WIEN, INSTITUTE OF ANALYSIS AND SCIENTIFIC COMPUTING

Vienna, Austria

03/2015-07/2015

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

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, Maple, 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 Google Local Guide Level 7, Weirdly enthusiastic about his Dyson
Less Usefull Skills	Juggling, 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,