FREDERIK WENKEL

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EDUCATION

Since Sep 2019 **University of Montreal, Mila – Quebec AI Institute** **Montreal – Canada**
Ph.D. candidate in Applied Mathematics
- Research: Data-driven Graph Neural Network filters for universal pattern recognition on graphs (Prof. Guy Wolf)
- Focus: Geometric Deep Learning, Graph Neural Networks, Graph Signal Processing
- Fin-ML excellence scholarship (Prof. Manuel Morales)

2017 – 2019 **Technical University of Munich** **Munich – Germany**
M.Sc. Mathematics
- Thesis: Logarithmic Sobolev Inequality – Euclidean & Riemannian Setting (Prof. Daniel Matthes)
- Focus: Machine Learning, Deep Learning, Optimal Transport
- Semester abroad at Université du Québec à Trois-Rivières, Canada (Fall 2017)

2013 – 2017 **Technical University of Munich** **Munich – Germany**
B.Sc. Mathematics
- Thesis: Proof of the Logarithmic Sobolev Inequality (Prof. Daniel Matthes)
- Focus: Probability Theory, Optimization, Minor in Economics
- Semester abroad at Université de Bordeaux, France (Fall 2015)

2011 – 2013 **Gymnasium Landschulheim Kempfenhausen** **Berg – Germany**
Abitur (university entrance qualification)

PUBLICATIONS

Can Hybrid Geometric Scattering Networks Help Solve the Maximal Clique Problem? *Preprint (arXiv:2206.01506) 2022*
Yimeng Min, Frederik Wenkel, Michael Perlmutter, Guy Wolf

Overcoming Oversmoothness in Graph Convolutional Networks via Hybrid Scattering Networks *Preprint (arXiv:2201.08932) 2022*
Frederik Wenkel, Yimeng Min, Matthew Hirn, Michael Perlmutter, Guy Wolf

Towards a Taxonomy of Graph Learning Datasets *DCAI workshop at NeurIPS 2021*
Renming Liu, Semih Cantürk, Frederik Wenkel, Dylan Sandfelder, Devin Kreuzer, Anna Little, Sarah McGuire, Leslie O'Bray, et al.

Data-Driven Learning of Geometric Scattering Networks *IEEE MLSP 2021*
Alexander Tong, Frederik Wenkel, Kincaid MacDonald, Smita Krishnaswamy, Guy Wolf

Geometric Scattering Attention Networks *IEEE ICASSP 2021*
Yimeng Min, Frederik Wenkel, Guy Wolf

Scattering GCN: Overcoming Oversmoothness in Graph Convolutional Networks *NeurIPS 2020*
Yimeng Min, Frederik Wenkel, Guy Wolf

A Company's Digital Twin *TUM Data Innovation Lab 2018*
Sagarika Kathuria, Jieyi Zhang, Frederik Wenkel, Pooreumoe Kim, Laure Vuaille

WORK EXPERIENCE

Jan 2018 **Roland Berger** **Munich – Germany**
3 months *Intern – Business Technology*
Implemented a dashboard for monitoring and optimization of internal business processes

Mar 2017 **BMW** **Munich – Germany**
6 months *Intern – Application Management, Cloud-Solutions*
Coordinated integration of a monitoring platform; analyzed the cloud integration process for 3 cloud providers

Aug 2016 **Infineon Technologies** – largest German chipmaker **Munich – Germany**
6 months *Working Student – Processes and Tools*
Implemented 2 software solutions in Visual Basic; helped to develop a new sales forecasting model

Feb 2016 **Gothaer Health Insurance** **Cologne – Germany**
3 months *Intern – Actuarial Office*
Modelled interest scenarios for a pension insurance product; developed company & industry KPIs

Mar 2013 **Deutsche Post** **Schorn – Germany**
12 months *Sorter – Logistics*
Operated and coordinated sorting machines and sorted mail manually

TEACHING EXPERIENCE

Nov 2021 **IVADO - Institut de Valorisation des Données** **Montreal – Canada**
3 months *Lecturer – Open Online Class*
Gave 4 lectures about Graph Neural Networks for financial applications that will be part of an open online class

2020 – 2021 **University of Montreal** **Montreal – Canada**
Teaching assistant – Department of Mathematics and Statistics
Spectral Graph Theory (Fall 2021), Theoretical Foundations of Data Science (Winter 2020 & 2021)

Sep 2018 **Technical University of Munich** **Munich – Germany**
2 months *Teaching assistant – TUM School of Management*
Introduced 20+ management students to the mathematical foundations of management studies

Jul 2017 **BMW** **Munich – Germany**
2 months *Programming instructor*
Organized and taught introductory class in Visual Basic for 15+ BMW employees

2011 – 2017 **Private Tutor in Mathematics, Physics and Chemistry** **Starnberg – Germany**

TALKS & RESEARCH ACTIVITIES

July 2022 **University of British Colombia** **Kelowna – Canada**
BIRS Workshop: Deep Exploration of non-Euclidean Data with Geometric and Topological Representation Learning
Talk: Solving Graph Learning Tasks via Hybrid Scattering Models

May 2022 **Laboratoire des Sciences du Numérique de Nantes** **Nantes – France**
Kymatio Workshop: Deep Learning meets Wavelet Theory
Talk: Solving Graph Learning Tasks via Hybrid Scattering Models

Dec 2020 **Mila – Quebec AI Institute** **Montreal – Canada**
ongoing *Graph-Taxonomy Initiative*
Creating a better understanding of the properties of benchmarking datasets for Graph Neural Network research

Apr 2021 **Fields Institute** **Toronto – Canada**
3 weeks *Extended Problem Solving Workshop*
Developed a macro-economic agent-based model based on a Deep Learning framework

Jun 2021 **Mila – Quebec AI Institute** **Montreal – Canada**
4 months *LambdaZero – Recover*
Collaborated on drug discovery project for the identification of synergetic drug combinations

Oct 2021 **Celonis, Technical University of Munich** **Munich – Germany**
5 months *A Company's Digital Twin*
Developed a prototype of a digital twin of a company based on a Markov model

SKILLS & INTERESTS

Languages Native: German – Fluent: English & French

IT Skills Very good: Python, LaTeX, MS Office – Good: Linux, VS Code, MATLAB, R, Visual Basic – Basic: JAVA, SQL

Charity Bandleader at Fairplayed Music Concerts: Organized 40+ rehearsals, 2 concerts, played trombone, raised ca. € 7000
Voluntary tutor at student initiative: Supported a young immigrant during his graduation year at school
Co-organizer of junior staff initiative at BMW: Organized social and cultural events for interns

Interests Music: Trombone, guitar – Sports: Basketball, volleyball, skiing, chess