Silas Alberti

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EDUCATION

University of California, Berkeley Visiting Student   2021
- Research project with Prof. Bruno Olshausen about capsules & deformable sparse coding
- Research project with Prof. Song Mei about theory of neural networks
- Fully funded by German National Merit Scholarship (ca. $18,000)

University of Munich BSc Mathematics (Minor: Computer Science)   2019 -
- **Valedictorian** in a class of ~400 students, **GPA 4.0/4.0**   2022
- *Highest-ranked university in Germany according to Times, U.S. News and ARWU*
- Research assistant for Prof. Kutyniok (Bavarian AI Chair for Mathematical Foundations of AI)
- Seminar talk about "Optimal Approximation with Sparsely Connected Deep Neural Networks"

Jugend trainiert Mathematik Elite Math Coaching Program   2014 -
- Highly selective nationwide preparation program for International Math Olympiad   2017

Vestisches Gymnasium Kirchhellen Abitur (High School)   2011 -
- Best result in school's history, **GPA 4.0/4.0**, 897/900 points   2019
- Personal congratulation by Armin Laschet, prime minister of state (NRW)

EXPERIENCE

Incoming Quantitative Trading Intern, Jane Street, London   2022

Machine Learning Researcher, Machine Learning at Berkeley (ML@B)   2021

Research Assistant, University of Munich, Mathematics Department   2021
- Research group: "Mathematical Foundations of AI" by Prof. Gitta Kutyniok
- Project about a new benchmark and new architectures for detecting directionality in Graph Neural Networks (GNNs), using Python & PyTorch on a GPU cluster

Full Stack Engineer, Part Time, Fulfin, Munich   2019 -
- Spearheaded the development of new operations platform using Python, JavaScript & AWS   2021
- Reduced marketing cost by building a cloud-based distributed web scraper using Python

Research Internship, Ruhr-West University of Applied Sciences, Computer Science Department   2016
- Robotics project with humanoid robot "Nao", using C and Python

SCHOLARSHIPS & AWARDS

Silver Medal German National Math Olympiad   2016

German National Merit Scholarship Studienstiftung des deutschen Volkes   2020 -
- "The German Academic Scholarship Foundation is Germany's largest, oldest and   now
  most prestigious scholarship foundation." (Wikipedia)

Scholarship e-fellows (awarded for best Abitur result)   2019

Research Award Lion's Club   2018
- 1st place out of 80 submissions for project on mathematical quantum mechanics

Fellowship German Student Academy (DSA)   2017

1st prize German National Math Competition (BWM), 2nd round   2017

1st prize Bundeswettbewerb Fremdsprachen Latein   2016
- One of two from my state (NRW) to qualify for federal finals

RESEARCH PROJECTS

Convolutions and Invariance Improve Generalization of Shallow Neural Networks and Kernels (2021)
*Silas Alberti, Song Mei (in preparation for **ICML 2022**)*
Research project at Berkeley while visiting Peter Bartlett's group (Aug 21 – Dec 21)

Local Capsule Hierarchies: Learning Deformable Part-Whole Hierarchies (2021)
Silas Alberti, Nitish Dashora*, Domas Buracas*, Bruno Olshausen (in preparation for **NeurIPS 2022**, poster presentation at **BEARS Symposium 2021**)*
Research project at Berkeley with BAIR and Redwood Center for Theoretical Neuroscience

Benchmark and Architectures for Detecting Directionality with Graph Neural Networks (2021)
Silas Alberti, Ron Levie, Gitta Kutyniok (in preparation for publication)
Research project with research group "Mathematical Foundations of AI" at University of Munich

Die Heisenberg'sche Unschärferelation anhand von diskreten Wahrscheinlichkeitsverteilungen (2018)
(Translation: "Deriving Heisenberg's uncertainty principle in discrete probability spaces")
Silas Alberti (1st place out of about 80 submissions at Lion's Club Research Award)
Research project I pursued on my own when I was 16

LEADERSHIP & TEACHING EXPERIENCE

Vice County Chairman, National Student Association   2018 -
- Organized and moderated events with over 500 attendees   2020
- Discussed political issues with Yvonne Gebauer, the state's education minister

Coach and Lecturer, Math Olympiad Summer Camps   2017 -
- After being a participant myself for years, I coached an elite cohort of students in   2018
  advanced problem-solving techniques for Math competitions

Professional Training in Conducting a Choir   2016 -
- 3-year C-degree in organ music and conducting a choir at Episcopal Music School Essen.   2020
- Throughout the training, I led rehearsals and conducted live performances at concertos

OTHER INTERESTS

Classical Music
- Piano (11 years), Organ (4 years), Saxophone (8 years, Brass ensemble), Accordion (self-taught)