Philippe von Wurstemberger

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Date of Birth	27^{th} October 1993	**Email**	philippe.vonwurstemberger@math.ethz.ch

Education

2016 - 2018 ETH Zurich - Master of Science in Mathematics

Overall Grade Point Average: 5.96 (out of 6)
mit Auszeichnung / summa cum laude

Fall 2015 Princeton University - Exchange semester

2012 - 2015 ETH Zurich - Bachelor of Science in Mathematics

Overall Grade Point Average: 5.88 (out of 6)
mit Auszeichnung / summa cum laude

2006 - 2012 Kantonsschule Rychenberg, Winterthur - Swiss Matura Degree

Profile: Modern Languages (English/Russian)
Overall Grade Point Average: 5.1 (out of 6)

Employment

09/2019 - Present ETH Zurich - PhD Student under the supervision of Prof. Patrick Cheridito and Prof. Arnulf Jentzen

10/2018 - 08/2019 ETH Zurich - PhD Student under the supervision of Prof. Arnulf Jentzen

05/2018 - 06/2018 ETH Zurich - Research Assistant in the group of Prof. Arnulf Jentzen

Spring 2017 ETH Zurich - Teaching Assistant for the Course Probability and Statistics

Fall 2016 ETH Zurich - Teaching Assistant for the Course Linear Algebra I

03/2016 - 06/2016 Accenture - Technology consulting for a Swiss bank

Fall 2014 ETH Zurich - Teaching Assistant for the Course Analysis I

08/2017 - 10/2018 Free Walk Zurich - Tour guide in Zurich

Publications and accepted preprints

- **Numerical simulations for full history recursive multilevel Picard approximations for systems of high-dimensional partial differential equations** (with Becker, S., Braunwarth, R., Hutzenthaler, M., Jentzen, A.). Commun. Comput. Phys., **28** (2020). [Arxiv].
- **Overcoming the curse of dimensionality in the approximative pricing of financial derivatives with default risks** (with Hutzenthaler, M., Jentzen, A.). Electron. J. Probab., **25** (2020). [Arxiv].
- **A proof that artificial neural networks overcome the curse of dimensionality in the numerical approximation of Black-Scholes partial differential equations** (with Grohs, P., Hornung, F., Jentzen, A.). [Arxiv] (2018). To appear in the *Mem. Amer. Math. Soc.*

- **Overcoming the curse of dimensionality in the numerical approximation of semilinear parabolic partial differential equations** (with Hutzenthaler, M., Jentzen, A., Kruse, T., Nguyen, T. A.). Proc. R. Soc. A **476** (2020). [Arxiv].
- **Lower error bounds for the stochastic gradient descent optimization algorithm: Sharp convergence rates for slowly and fast decaying learning rates** (with Jentzen, A.). J. Complexity **57** (2020). [Arxiv].
- **Strong error analysis for stochastic gradient descent optimization algorithms** (with Jentzen, A., Kuckuck, B., Neufeld, A.). IMA J. Numer. Anal. (2020). [Arxiv].

Preprints

- **High-dimensional approximation spaces of artificial neural networks and applications to partial differential equations** (with Beneventano, P., Cheridito, P., Jentzen, A.). [Arxiv] (2020).

Invited talks

05/2018 Stochastic Optimization Seminar at ETH Zurich
Error analysis and lower error bounds for SGD

10/2018 PhD Application talk for the Seminar of Applied Mathematics at ETH Zurich
Error analysis and lower error bounds for the stochastic gradient descent optimization algorithm

05/2019 SMAI, Guidel Plages.
Overcoming the course of dimensionality with DNNs: Theoretical approximation results for PDEs

07/2019 International Conference on Computational Finance, A Coruna.
Overcoming the course of dimensionality with Deep Learning: Methods and theoretical results for PDEs

Awards

- **ETH Medal** (2019) for an outstanding Master's thesis

Personal interests

- **Mountain sports** (skiing, monitoring ski camps, hiking, rock climbing)
- **Diving**
- **Dancing and playing music** (Lindy hop, drums, piano)
- **Solo travels**