

Michiel Straat

Curriculum Vitae

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Date of Birth: 30.12.1994 - Nationality: Dutch

Current position

10/2018-Present **PhD candidate**, *Statistical Physics of Learning*, Intelligent Systems, Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence.
University of Groningen, The Netherlands

Work experience

06/2017-12/2017 **Philips**, *Internship*, Drachten, The Netherlands.

Education

09/2016-09/2018 **Master's Degree in Computing Science (Specialization: Intelligent Systems and Visualization)**, *University of Groningen*, Faculty of Science and Technology, Cum Laude.
Thesis: [On-line Learning in Neural Networks with ReLU Activations](#)
Supervisors: Prof. Dr. Michael Biehl and Dr. Kerstin Bunte

09/2013-08/2016 **Bachelor's Degree (Dutch Dipl.- Inform.) in Computing Science**, *University of Groningen*, Faculty of Science and Technology.
Thesis: [Time Series Classification in Complex Fourier Space](#)
Supervisors: Prof. Dr. Michael Biehl and MSc. Friedrich Melchert

09/2014-04/2015 **C++**, *University of Groningen*, Given by Prof. Dr. F.B. Brokken.

08/2007-07/2013 **High School**, *Stedelijk Gymnasium (Grammar school)*, Leeuwarden, Degree: Nature and Technology + Health (Dutch: Natuur en Techniek + Gezondheid (NT/NG)).
Additional courses: Computer Science and Economics

Teaching

Teaching Assistant

11/2019-01/2020 **Advanced Algorithms and Data Structures**, *Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence*, University of Groningen, The Netherlands.

09/2019-11/2019 **Modelling and Simulation**, *Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence*, University of Groningen, The Netherlands.

09/2017-11/2017 **Information Security**, *Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence*, University of Groningen, The Netherlands.

09/2016-11/2016 **Information Security**, *Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence*, University of Groningen, The Netherlands.

Supervision

2019 **Co-supervision Master student**, *E. Oostwal*, University of Groningen, The Netherlands.

2019 **Co-supervision Master student**, *Z. Kan*, University of Groningen, The Netherlands.

Awards

2017 **Best paper award**, *Computer Science Student Colloquium*, Paper: [Segmentation of Blood Vessels in Retinal Fundus Images](#).

2016 **Best presentation award**, *BSc. thesis symposium*, Thesis: Time Series Classification in Complex Fourier Space.

Languages

Dutch (mother tongue), English (fluent), German (Limited Working Proficiency)

Publications

- 2019 Straat, M. and M. Biehl. "On-line learning dynamics of ReLU neural networks using statistical physics techniques". In: *Proc. European Symposium on Artificial Neural Networks (ESANN) 2019, Bruges/Belgium*. Ed. by M. Verleysen.
- Straat, M., M. Kaden, et al. "Learning vector quantization and relevances in complex coefficient space". In: *Neural Computing and Applications*. ISSN: 1433-3058. DOI: [10.1007/s00521-019-04080-5](https://doi.org/10.1007/s00521-019-04080-5). URL: <https://doi.org/10.1007/s00521-019-04080-5>.
- 2018 Straat, Michiel et al. "Statistical Mechanics of On-Line Learning Under Concept Drift". In: *Entropy* 20.10. ISSN: 1099-4300. DOI: [10.3390/e20100775](https://doi.org/10.3390/e20100775). URL: <http://www.mdpi.com/1099-4300/20/10/775>.
- 2017 Straat, M., M. Kaden, et al. "Prototypes and matrix relevance learning in complex fourier space". In: *2017 12th International Workshop on Self-Organizing Maps and Learning Vector Quantization, Clustering and Data Visualization (WSOM)*, pp. 1–6. DOI: [10.1109/WSOM.2017.8020019](https://doi.org/10.1109/WSOM.2017.8020019).

Talks

- 12/09/2019 **Towards a statistical physics analysis of multilayer ReLU neural networks**, *The 11th Mittweida Workshop on Computational Intelligence*, Hochschule Mittweida, Germany, [Slides](#). [Abstract](#)
- 26/04/2019 **On-line learning dynamics of ReLU neural networks using statistical physics techniques**, *European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning - ESANN 2019*, Bruges, Belgium, [Slides](#).
- 29/06/2017 **Prototypes and matrix relevance learning in complex Fourier space**, *12th International Workshop on Self-Organizing Maps and Learning Vector Quantization, Clustering and Data Visualization*, Laboratoire lorrain de recherche en informatique et ses applications (Loria), Nancy, France, [Slides](#).
- 04/2017 **Segmentation of blood vessels in retinal fundus images**, *University of Groningen*, The Netherlands, [Slides](#).