Rik Voorhaar

Mathematics PhD student specialized in researching numerical linear algebra and optimization. Experienced in developing fast robust numerical code. Skilled communicator and fast learner with an analytical mindset.

Contact Details

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 Location: Geneva *(until 09/2022)*. Copenhagen *(from 10/2022)*
 Website: rikvoorhaar.com
 Github: github.com/rikvoorhaar

Work Experience

03/2018–12/2022 *(expected)*. **PhD in Applied Mathematics.** *University of Geneva*. Advisor: Bart Vandereycken
Started PhD in pure mathematics, switched after two years to applied mathematics (numerical linear algebra). Focused on advanced numerical optimization algorithms, particularly Riemannian optimization algorithms for low-rank tensor decompositions and their applications to machine learning.
Developed 3 open-source numerical Python libraries (available on my GitHub repository) leading to 3 publications with 4th in progress. Contributed code to 2 numerical open-source projects.
Taught 3 courses per year as assistant, receiving consistent positive feedback from students for clear solutions and lectures, particularly for my interactive Python programming projects.

06/2021–present. **Senior scientific editor.** *The Science Breaker.*
Edited summaries of published scientific research in a collaborative process to improve the readability for lay readership to help researchers reach a wider audience. Authors give universally positive feedback on my editing. The articles I edited are consistently among the topmost read on the website.

2020–present. **Coding and research blog**. *rikvoorhaar.com.*
Wrote blog posts on advanced topics related to data science and numerical mathematics, discussing mathematical modelling, numerical optimization, and machine learning. Targeted both lay and wide scientific audiences. Blog receives an average 900 views and 18,000 search impressions per month.

Education

2015–2018. *MSc. (Hons.)* **Mathematical Sciences**, Utrecht University, *cum laude (GPA 4.00)*
Masterclass Geometry, Topology and Physics, University of Geneva.
2012–2015. *BSc.* **Mathematics**, Utrecht University, *cum laude (GPA 4.00)*.
BSc. **Physics and Astronomy**, Utrecht University, *cum laude (GPA 4.00)*.
International exchange program, Kyoto University.

Skills

Languages:	Bilingual: English, Dutch. Intermediate: French. Elementary: Danish, Japanese, Russian.
General:	Communication, HPC, software development, gradient-based and convex optimization
Programming:	Advanced: Python. Intermediate: C++, Mathematica, LaTeX. Elementary: Matlab, R.
Software:	Docker, Git, Linux, Microsoft Word, Excel, Windows
Libraries:	Cython, Cupy, Numpy, Pandas, PyTorch, Scipy, TensorFlow

Certificates

2021. **Neuroscience and Neuroimaging Specialization**, John Hopkins University, *on Coursera.*
2020. **Data Science Specialization**, John Hopkins University, *on Coursera.*
2019. **Machine Learning Specialization**, Higher School of Economics, *on Coursera.*

Publications

2022. TTML: tensor trains for general supervised machine learning
arXiv:2203.04352, *joint with Bart Vandereycken* (submitted)
2021. On certain Hochschild cohomology groups for the small quantum group
arXiv:2104.05113, *joint with Nicolas Hemelsoet.* (submitted)
2021. A computer algorithm for the BGG resolution
Published in the Journal of Algebra, *joint with Nicolas Hemelsoet*.
2018. Parallel 2-transport and 2-group torsors
arXiv:1811.10060.