Rik Voorhaar

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Summary

PhD student in applied mathematics, graduating December 2022. During PhD I have developed strong quantitative, analytic and communication skills. I am an experienced Python software developer, particularly for numerical and data science software. I am Dutch and I am moving to Copenhagen for family reasons.

Work experience

Senior Scientific Editor, June 2021–current at *The Science Breaker* (thesciencebreaker.org)

- Volunteered for science communication journal publishing layperson summaries of peer reviewed research.
- Automated creation of PDF versions of articles using Jinja and LaTeX, with an interface made with Flask deployed on Heroku, saving team members 10 minutes per published article.

PhD in Applied Mathematics, March 2018–current at *University of Geneva*.

Relevant projects:

- *Streaming Tensor Train Approximation* (GitHub: `tt-sketch`)
  - Developed scalable randomized algorithm for approximating very large tensors in collaboration with leading scientists in field.
  - Implemented algorithm using numpy and Cython with full documentation, high test coverage, and consistent use of Python typehints.
  - Manuscript will be submitted to top numerical mathematics journal in 08/2022.
- *TTML: tensor trains for general supervised machine learning* (GitHub: `ttml`)
  - Invented novel machine learning algorithm using low-rank tensor approximations of discretized functions.
  - Applied advanced non-linear optimization methods and novel initialization techniques.
  - Innovated high-quality, fast user-friendly library with partial cross-libary support
  - Submitted preprint to top quartile machine learning journal.
  - Contributed to two numerical open source libraries during project. (GitHub: `geoopt` and `autoray`)
- *Computer algorithm of the BGG resolution & applications* (GitHub: `bgg-cohomology`)
  - Improved and implemented important algorithm in computational algebra.
  - Coded fast implementation as Python library using Cython and Sagemath.
  - Published two articles in top quartile mathematics journal.
- *Personal blog*
  - Authored 14 posts related to data science, statistics, computer vision, and numerical mathematics.
  - Achieved 1.2k monthly views, and positive reviews by peers
- *Teaching*
  - Composed Jupyter notebooks for courses on probability & statistics, convex optimization, and quantum computing. All notebooks have tests to give direct feedback to students.
  - Assisted courses on programming, numerical analysis, mathematics for computer scientists, and hosted interactive tutoring sessions. Received consistent positive feedback from students for my teaching methods.
  - Created searchable website with solutions for two courses using Sphinx and Jupyter notebooks.
  - Mentored students in two data science competitions involving data mining and prediction of retail sales data.

Skills

Languages:	*Bilingual*: English, Dutch. *Intermediate*: French. *Elementary*: Japanese, Russian, Spanish.
General:	Machine learning, Bayesian Statistics, Computer vision, Software development, Time series analysis.
Programming:	Python, C++, Mathematica, LaTeX, SQL, R.
Software:	Docker, Git, Linux, Office Suite, Windows.
Libraries:	Cython, Cupy, Numpy, Pandas, PyTorch, Scipy, Tensorflow.

Education

2018–2022	*PhD.* **Applied mathematics**, University of Geneva.
2015–2018	*Msc. (Hons.)* **Mathematical Sciences**, Utrecht University, *cum laude (GPA 4.00)*.
2012–2015	*Bsc.* **Mathematicics**, Utrecht University, *cum laude (GPA 4.00)*.
2012–2015	*Bsc.* **Physics and Astronomy**, Utrecht University, *cum laude (GPA 4.00)*.

Certifications

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