

# Raphaël Morsomme

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<https://rmorsomme.github.io/>

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## Education

**Academic interests:** statistics, Bayesian inference, Markov Chain Monte Carlo, data augmentation, conformal prediction, stochastic epidemic models, dynamic models.

- 2019 – present: **Ph.D. candidate in statistical science**,  
Duke University Department of Statistical Science.  
Supervisor: Prof. Jason Xu.  
Thesis: Efficient block MCMC sampler for high-dimensional latent data.
- 2014 – 2018: **Double B.S. degree in *Liberal Arts and Sciences***,  
University College Maastricht, The Netherlands; University College Freiburg, Germany.  
Honors program, *Summa cum Laude*.

## Publications

- Morsomme, R.**, & Xu, J. (2022). Uniformly Ergodic Data-Augmented MCMC for Fitting the General Stochastic Epidemic Model to Incidence Data. arXiv preprint arXiv:2201.09722.
- Morsomme, R.**, & Smirnov, E. (2020). Valid Prediction Intervals for Course Grades with Conformal Prediction. In 2020 19th IEEE International Conference on Machine Learning and Applications (ICMLA) (pp. 936-941). IEEE.
- Morsomme, R.**, & Smirnov, E. (2019). Conformal Prediction for Students' Grades in a Course Recommender System. *Conformal and Probabilistic Prediction and Applications* (pp. 196-213).
- Morsomme, R.**, & Alferez, S. V. (2019). Content-based course recommender system for liberal arts education. In *Proceedings of The 12th International Conference on Educational Data Mining (EDM 2019)* (Vol. 748, p. 753).
- Morsomme, R.** (2018). Embryonic and mitochondrial modeling in the context of *in-vitro* fertilization. Bachelor Thesis, Maastricht University, Department of Clinical Genetics.
- Morsomme, R.** (2017). Financial instability forecasting based on an anomaly analysis of soft content. Bachelor Thesis, Freiburg University, Information System Research Institute.

## Awards and grants

- 2022: Outstanding Mentor of Undergraduate Research Award,  
Department of Statistical Science, Duke University.
- 2022: Summer Course Development Grant,  
Duke University.
- 2022: Full scholarship, Summer Institute in Statistics and Modeling in Infectious Diseases,  
University of Washington.

2021: Young Investigator Award,  
ASA Section on Statistics in Epidemiology.

## Teaching and Mentoring

### Teaching assistant

2022: STA310 Generalized Linear Models (undergraduate),  
Department of Statistical Science, Duke University.

2021: STA723 Case Studies in Bayesian Statistics (Ph.D.),  
Department of Statistical Science, Duke University.

2020: STA540 Case Studies in Statistical and Data Science (masters),  
Department of Statistical Science, Duke University.

2019: STA440 Case Studies in the Practice of Statistics (undergraduate),  
Department of Statistical Science, Duke University.

2017: Introduction to Statistics and Data Analysis (undergraduate),  
University College Freiburg, Freiburg University.

### Instructor of record

2022: STA101 Data Analysis and Statistical Inference,  
Department of Statistical Science, Duke University.

2021: STA101 Data Analysis and Statistical Inference,  
Department of Statistical Science, Duke University.

### Tutoring and mentoring

2021 – present: Academic mentor of J. Huang.  
Duke University, statistics major.

2021 – present: Academic tutor,  
SPIRE Fellows Program, Duke University.

2020 – 2021: Research mentor,  
Lumiere Research Scholar Program.

## Professional Experience

2022: Statistical consultant,  
MetLife Investment Management, New York.  
Task: implement a scalable dynamic Bayesian forecasting system for high-dimensional time series.

2020: Programming consultant,  
Children's Environmental Health Initiative, Rice University.  
Task: review code for a spatial analysis of racial and political disparity

2019: Statistical Consultant,  
Future Earth, Paris.  
Task: implement a topic model of open-ended survey questions.

- 2018 – 2019: Junior Data Scientist,  
University College Maastricht.  
Task: topic modeling of course content, conformal prediction of course grade and development of a course recommender system for Liberal Arts students.
- 2017: Research Assistant,  
The Information System Research Institute, Freiburg.  
Task: trading decision support system based on a sentiment analysis of financial news.

## Outreach

- 2018 – present: Semi-annual workshop: Introduction to R,  
Maastricht University College.
- 2022: Judge for the Community College Data Fest,  
American Mathematical Association of Two-Year Colleges.
- 2021: Judge for DataFest,  
American Statistical Association.

## Programming skills

Proficiency in **R**, **MATLAB**, **LaTeX**, **Git**, **Quarto**, **STAN**.  
Working knowledge of Python, SAS, SQL, Tableau, Weka, C++.

## Volunteering and interests

- 2016 – present: Run marathons.
- 2015: Represented Belgium at the final of the *Euromath Cup* – 3<sup>rd</sup> place.
- 2014 – 2019: Volunteer at the Red Cross.
- 2005: International finalist of the *Championship of Math & Logic Games*.