

Antoine Van Biesbroeck

Centre Borelli - ENS Paris-Saclay
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<https://vbkantoine.github.io>

Assistant professor

My research focuses Bayesian statistics, sensitivity and uncertainty quantification in machine learning frameworks.
I am looking for a novel research position in Singapore, where I could work with a dynamic team on exciting projects.

Professional experience

Since 2025 Assistant professor - ENS Paris-Saclay (France)

Research in Bayesian statistics, sensitivity analysis and uncertainty quantification in ML at Centre Borelli.

2022-2025 Research associate - CEA Paris-Saclay (France)

Research on Bayesian learning for seismic risk assessment studies in the nuclear industry.

2021-2022 Data Scientist - EDF China, Beijing (China)

Research & Development on Machine Learning projects within the Digital Innovation team of EDF China.

2021 Research intern in Bayesian statistics - CEA Paris-Saclay (France)

Research subject: 'Objective prior construction for Bayesian estimation of seismic fragility curves'.

2019 Research intern in Deep Learning - Institute of Industry and Sciences, Guangzhou (China)

Research subject: 'Surface mesh generation based on segmentation via Deep Learning'.

Education

2022-2025 PhD - Ecole Polytechnique, Palaiseau (France)

Thesis subject: 'Extended reference prior theory for objective and practical inference, application to robust and auditable seismic fragility curves estimation'. Supervised by Josselin Garnier. Collaboration with CEA (French atomic energy commission).

2020-2021 Master's degree MVA - Université Paris-Saclay, Gif-sur-Yvette (France)

Master's degree 'Mathématiques Vision Apprentissage'. Training in applied maths to statistical learning.

2017-2021 Normalien - ENS Paris-Saclay (France)

4 years graduate program which aims at training high level researchers in sciences.

(2020) Laureate of the 'agregation' competitive examination in mathematics, ranked 3rd.

2014-2017 Classes préparatoires - Lycées Daudet & Champollion, Nîmes & Grenoble (France)

Post-secondary intensive program in sciences to pass competitive examination for graduate schools.

Teaching

Since 2025 Assistant professor in mathematics - ENS Paris-Saclay (France)

2022-2025 Teaching assistant in mathematics - Ecole Polytechnique, Palaiseau (France)

2019-2021 Examiner in mathematics - Lycée Saint-Louis, Paris (France)

Publications

Regular papers

- 2025 A. Van Biesbroeck, C. Gauchy, C. Feau and J. Garnier, Robust a posteriori estimation of probit-lognormal seismic fragility curves via sequential design of experiments and constrained reference prior, *Nuclear Engineering and Design*, 448. 2026.
- 2025 N. Baillie, A. Van Biesbroeck and C. Gauchy, Variational inference for approximate objective priors using neural networks, *Computo*. 2025.
- 2024 A. Van Biesbroeck, Properly constrained reference priors decay rates for efficient and robust posterior inference, *arXiv.2409.13041*. 2024.
- 2024 A. Van Biesbroeck, C. Gauchy, C. Feau and J. Garnier, Design of experiments based on a low fidelity model for seismic fragility curves estimation, *ESAIM: ProcS*, 79. 2025.
- 2023 A. Van Biesbroeck, Generalized mutual information and their reference priors under Csizar f-divergence, *arXiv.2310.10530*. 2023.
- 2023 A. Van Biesbroeck, C. Gauchy, C. Feau and J. Garnier, Reference prior for Bayesian estimation of seismic fragility curves, *Probabilistic Engineering Mechanics*, 76. 2024.
- 2021 A. Van Biesbroeck, F. Shang and D. Bassir, CAD Model Segmentation Via Deep Learning, *International Journal of Computational Methods*, 18.3. 2021.

Proceedings

- 2025 A. Van Biesbroeck, C. Feau and J. Garnier, [Design of experiments for efficient and conform Bayesian learning of seismic fragility curves](#), *Proceedings of the 28th International Conference on Structural Mechanics In Reactor Technology (SMiRT)*. 2025.
- 2025 N. Baillie, A. Van Biesbroeck, C. Feau and C. Gauchy, [Bayesian estimation of seismic fragility curves based on variational reference priors using neural networks](#), *Proceedings of the 6th Thematic Conference on Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP)*. 2025.
- 2023 C. Gauchy, A. Van Biesbroeck, C. Feau and J. Garnier, [Inférence variationnelle de lois a priori de référence](#), *Proceedings des 54èmes Journées de Statistiques (JdS)*. 2023.
- 2023 A. Van Biesbroeck, C. Gauchy, J. Garnier and C. Feau, [Connections between reference prior theory and global sensitivity analysis, an illustration with f-divergences](#), *Proceedings des 54èmes Journées de Statistiques (JdS)*. 2023.
- 2023 A. Van Biesbroeck, C. Gauchy, C. Feau and J. Garnier, [Influence of the choice of the seismic intensity measure on fragility curves estimation in a Bayesian framework based on reference prior](#), *Proceedings of the 5th Thematic Conference on Uncertainty Quantification in Computational Sciences and Engineering (UNCECOMP)*. 2023.

Contributions in international conference

- 2025 SMiRT (*28th International Conference on Structural Mechanics In Reactor Technology*). [Co-chair in technical session](#). Toronto, Canada. 14 Aug. 2025.
- 2025 O'Bayes (*Objective Bayes Methodology Conference*). [Poster](#). Athens, Greece. 9 Jun. 2025.
- 2025 AICOMAS (*1st ECCOMAS Artificial Intelligence and Computational Methods in Applied Science*). [Contributed talk](#). Paris, France. 20 Feb. 2025.
- 2024 ISBA (*ISBA world meeting*). [Poster](#). Venice, Italy. 4 Jul. 2024.
- 2024 SIAM UQ (*SIAM Conference on Uncertainty Quantification*). [Contributed talk](#). Trieste, Italy. 1 Mar. 2024.
- 2023 UNCECOMP (*5th ECCOMAS Thematic conference on Uncertainty Quantification in Computational Sciences and Engineering*). [Contributed talk and proceeding](#). Athens, Greece. 13 Jun. 2023.

Grants and awards

- 2024 ISBA travel award - *The International Society for Bayesian Analysis*
- 2024 ISAS best oral award - *Science days of ISAS, CEA (French atomic energy commission)*
- 2024 SIAM student travel award - *Society for Industrial and Applied Mathematics*
- 2022 CFR grant for doctoral studies - *CEA (French atomic energy commission)*
- 2017 Normalien civil servant grant - *ENS Paris-Saclay*

Additional skills

Programming Proficiency in **LaTeX** and **Python**.

Languages French (Native), English (Cambridge Advanced English grade C), Chinese (Notions).

Involvement

- 2024-2025 PhD student representative at the CMAP lab council.
- 2023-2024 PhD student representative at the EDMH doctoral school council.
- Since 2020 Co-founder and vice president of the Delaney Automobile Club.