

Antoine Van Biesbroeck

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PhD candidate in applied Bayesian statistics

Research in Bayesian statistics, sensitivity analysis and uncertainty quantification.

Professional experience

- 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'.
- 2018 Research intern in applied mathematics** - CMLA, Cachan (France)
Research subject: 'Systemic risk control in financial networks'.

Education

- 2022-2025 PhD** - Ecole Polytechnique, Palaiseau (France)
Thesis subject: 'Bayesian estimation of the seismic fragility for industrial structures and equipment'. Supervised by Josselin Garnier. Collaboration with CEA (French atomic energy commission).
- 2020-2021 Master's degree MVA** - Université Paris-Saclay, Paris-Saclay (France)
Master's degree 'Mathématiques Vision Apprentissage'. Training in applied maths to statistical learning.
- 2017-2021 Normalien** - Ecole Normale Supérieure Paris-Saclay, 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.
- 2014 High School diploma** - Lycée Saint-Stanislas, Nîmes (France)

Teaching

- 2022-2024 Teaching assistant in mathematics** - Ecole Polytechnique, Palaiseau (France)
Courses: Introduction to probability & statistics (Bachelor of Science program, 2nd year); Introduction to python (Engineer program, 1st year); Mathematical foundation of Data Science (Master of Science program, 1st year).
- 2019-2021 Examiner in mathematics** - Lycée Saint-Louis, Paris (France)

Publications

- 2023 A. Van Biesbroeck**, Generalized mutual information and their reference priors under Csizar f-divergence, *arXiv 2310.10530*. 2023.
- 2023 C. Gauchy, A. Van Biesbroeck, C. Feau and J. Garnier**, Inférence variationnelle de lois a priori de référence, *proceedings des 54èmes Journées de Statistique de la SFDS*. 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 Statistique de la SFDS*. 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 ECCOMAS Thematic Conference on Uncertainty Quantification in Computational Sciences and Engineering*. 2023.
- 2023 A. Van Biesbroeck, C. Gauchy, C. Feau and J. Garnier**, Reference prior for Bayesian estimation of seismic fragility curves, *arXiv 2302.06935*. 2023.
- 2021 A. Van Biesbroeck, F. Shang and D. Bassir**, CAD model segmentation via Deep Learning, *International Journal of computational methods* 18.3. 2021.

Contributions in international conferences

- 2024** **SIAM UQ** (*SIAM Conference on Uncertainty Quantification*). [Contributed talk](#). Trieste, Italy, 1 Mar. 2024.
- 2023** **JdS** (*54èmes Journées de Statistique de la SFDS*). [Contributed talk and proceeding](#). ULB, Brussels, Belgium, 6 Jul. 2023.
- 2023** **UNCECOMP** (*5th ECCOMAS Thematic Conference on Uncertainty Quantification in Computational Sciences and Engineering*). [Contributed talk and proceeding](#). Athens, Greece. 13 Jun. 2023.

Contributions in national conferences and seminars

- 2024** **MASCOT-NUM** (*Méthodes d'Analyse Stochastique pour les Codes et Traitements Numériques*). [Poster](#). Giens, France, 3 Apr. 2024.
- 2024** **RJS** (*Rencontres Jeunes Statisticiens*). [Contributed talk](#). Porquerolles, France, 2 Apr. 2024.
- 2024** **SIMPAS** (*Statistique Apprentissage Simulation Image*). [Contributed talk](#). Puy-Saint-Vincent, France, 14 Mar. 2024.
- 2024** **SemDoct** (*Séminaire des doctorants du CMAP*). [Contributed talk](#). Ecole polytechnique, Palaiseau, France, 14 Feb. 2024.
- 2023** **SEISM** (*Seismology and earthquake engineering for risk assessment*). [Contributed talk](#). EDF, Palaiseau, France, 1 Dec. 2023.
- 2023** **ALLEGRIA** (*Applications et développement d'algorithmes d'Intelligence Artificielle*). [Contributed talk in seminar](#). CEA, Saclay, France, 16 Nov. 2023.
- 2023** **ETICS** (*Ecole Thématique sur les Incertitudes en Calcul Scientifique*). [Contributed talk](#). Cap Ferret, France, 12 Oct. 2023.
- 2023** **CJC-MA** (*Congrès des Jeunes Chercheurs en Mathématiques Appliquées*). [Contributed talk](#). CentraleSupélec, Gif-sur-Yvette, France, 25 Sept. 2023.
- 2023** **PSPP** (*Proba-Stats pour les Phénomènes Physiques*). [Contributed talk](#). EDF, Chatou, France, 21 Sept. 2023.
- 2023** **MASCOT-NUM** (*Méthodes d'Analyse Stochastique pour les Codes et Traitements Numériques*). [Poster](#). Le Croisic, France, 5 Apr. 2023.
- 2022** **AppliBUGS** (*Applications du Bayesian Unified Group of Statisticians*). [Contributed talk](#). Villeurbanne, France, 10 Jun. 2022.

Grants and awards

- 2024** **ISBA travel award** - *The International Society for Bayesian Analysis*
- 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.