

André Carlon

Curriculum Vitae

Department of Mathematics, RWTH-Aachen
Chair of Mathematics for Uncertainty Quantification
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Current position

2024- **Post-doctoral researcher at the Chair of Mathematics for Uncertainty Quantification, RWTH-Aachen, Aachen, Germany**

Education

2015-2019 **Doctorate of engineering, UFSC, Florianópolis, Brazil**
2013-2015 **Masters of engineering, UFSC, Florianópolis, Brazil**
2007-2013 **Bachelor of civil engineering, UFSC, Florianópolis, Brazil**

Doctorate Dissertation

Title *Bayesian optimization of experiments using stochastic gradient methods*
Supervisor Professor Rafael Holdorf Lopez

Masters Thesis

Title *Development of a new operator for metaheuristic algorithms based on stiffness maximization and its application to the optimization of truss structures*
Supervisors Professor Rafael Holdorf Lopez & Professor Leandro Flackel Miguel

Experience

2020-2024 **Post-doctoral fellow at the Stochastic Numerics Research Group, KAUST, Thuwal**
2017-2018 **Visiting student, KING ABDULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY (KAUST), Thuwal, Saudi Arabia**
During 2017-2018, went to KAUST as a visiting student to work with professor Raúl Tempone on optimal experimental design using stochastic gradient methods.

Grants and Awards

2025-2027 **Development of a methodology based on digital twins and artificial intelligence to support decision-making in the maintenance and management of railway bridges, Funding: CNPq/MCTI/FNDCT, Value: R\$ 360.000 ($\approx$ € 57.000), Proposal Contributor. Responsible for stochastic optimization of (a) sensor placement on railway bridges to maximize information gain, and (b) the training of digital-twin models for railway bridges**

Skills

Advanced	Bayesian inference, Uncertainty quantification methods, Reliability engineering, Deterministic and stochastic optimization, Convex analysis, Numerical analysis, Python, MATLAB, $\text{\LaTeX}$,
Intermediate	Elasticity theory, Non-linear structural analysis, JAX, Julia

Languages

Portuguese	Native language
English	Fluent
Spanish	Basic

Selected Publications

- 1 **Carlon, A.G.**, Espath, L. and Tempone, R., 2024. Approximating Hessian matrices using Bayesian inference: a new approach for quasi-Newton methods in stochastic optimization. *Optimization Methods and Software*, 39(6), pp.1352-1382. (Q2)
- 2 **Carlon, A.G.**, Kroetz, H.M., Torii, A.J., Lopez, R.H. and Miguel, L.F.F., 2022. Risk optimization using the Chernoff bound and stochastic gradient descent. *Reliability Engineering & System Safety*, 223, p.108512. (Q1) 10 citations
- 3 **Carlon, A.G.**, Dia, B.M., Espath, L., Lopez, R.H. and Tempone, R., 2020. Nesterov-aided stochastic gradient methods using Laplace approximation for Bayesian design optimization. *Computer Methods in Applied Mechanics and Engineering*, 363, p.112909. (Q1) 43 citations