Alessio Faraci

Early Stage Researcher

Nationality: Italian
Date of birth: November 30, 1993

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RESEARCH BACKGROUND AND INTERESTS

Uncertainty Quantification, Machine learning, Surrogate modelling, Gaussian Process, Reliability based design optimization, Bayesian optimization, Stochastic inverse problems, Grey-box modelling, Data-driven approaches.

EDUCATION

Oct 2021 – present   **Doctor of Philosophy - Ph.D.**, *Engineering - Computer Science*, École Doctorale des Sciences pour l'Ingénieur - Université Clermont Auvergne, France.

Oct 2016 – Dec 2019   **Master's degree**, *Civil Structural Engineering*, Politecnico di Torino, Italy.
Thesis: Bayesian inference of structural model parameters in an Uncertainty Quantification framework.
Supervisors: Prof. R. Ceravolo, Ph.D. G. Miraglia, Ass. Prof. G. Abbiati.
Final grade: 103/110.

PROFESSIONAL EXPERIENCE

Oct 2021 – present   **Early Stage Researcher**, *Clermont Auvergne INP, SIGMA Clermont, Institute Pascal*.
Project: ITN GREYDIENT - EU H2020 Marie Skłodowska-Curie Action
Research field: the use of machine learning and grey-box models to solve complex time-consuming RBDO problems.

Sept 2023 – Dec 2023   **Research And Development Engineer**, *Radiall*, Château-Renault, Centre-Vallée de la Loire, France.
Research field: application of machine learning to enhance the mating of wire connectors in avionics systems for RBDO problems.

Apr 2023 – Jul 2023   **Visiting Scholar**, *ETH Zürich*, Zürich, Switzerland.
Research field: developing novel, cost-effective strategies employing evolutionary algorithms and surrogate models to optimize complex engineering systems, reducing unnecessary computations.

Feb 2021 – Sept 2021   **Structural Engineer**, *Freelancer*, Turin.
Main duties: seismic assessment and retrofit of existing reinforced concrete structures.
Consultant engineer at *Alisea s.r.l.*, Turin (Feb. 2021 - Apr. 2021).
Focus: static and dynamic assessment of existing monitored prestressed concrete bridges.

Nov 2020 – Feb 2021   **Intern Engineer**, *EP&S s.c.a.r.l., SI.ME.TE. S.r.l.*, Torino.
Focus: Finite Element Analysis and design of reinforced and prestressed concrete structures, steel structures and foundations.

Apr 2020 – Oct 2021   **Research fellow**, *Earthquake Engineering & Dynamics Lab, DISEG, Politecnico di Torino*.
Research fields: seismic structural health monitoring, Bayesian nonlinear model calibration, uncertainty quantification (UQ), surrogate modelling, time-variant dynamic stochastic problems.

PUBLICATIONS

June 2023	**Conference paper**, *Faraci, A.; Beaurepaire, P.; Gayton, N.; An unified enrichment strategy for Reliability-Based Design Optimization using adaptive Kriging and zero-order algorithms*, (UNCECOMP 2023) ECCOMAS Proceedia ID: 10351.
September 2022	**Conference paper**, *Faraci, A.; Beaurepaire, P.; Gayton, N.; Review on Python toolboxes for Kriging surrogate modelling*, Proceedings of the 32nd European Safety and Reliability Conference (ESREL 2022). Published by Research Publishing, Singapore. DOI: 10.3850/978-981-18-5183-4_R16-08-037-cd.
August 2020	**Journal paper**, *Ceravolo R.; Faraci A.; Miraglia G.; Bayesian Calibration of Hysteretic Parameters with consideration of the Model Discrepancy for use in Seismic Structural Health Monitoring*, Applied Sciences 2020, 10, 5813. DOI: 10.3390/app10175813.

ATTENDANCE AT CONFERENCES, CONGRESS AND SEMINARS

September 2024	**Conference**, International Conference on Uncertainty in Structural Dynamics (USD2024), Leuven, Belgium.
May 2024	**Conference**, Engineering Mechanics Institute Conference and Probabilistic Mechanics & Reliability Conference (EMI/PMC 2024), Chicago, Illinois, United States.
June 2023	**Conference**, 5th International Conference on Uncertainty Quantification in Computational Science and Engineering (UNCECOMP 2023), Athens, Greece.
September 2022	**Conference**, 32nd European Safety and Reliability Conference (ESREL 2022), Technological University of Dublin, Ireland.
June 2022	**Conference**, MASCOT-NUM 2022, Sigma-Clermont, France.
September 2020	**Summer school**, *MECHRES20 - Mechanics and Performance of Resilient Structures and Infrastructures*, University of Trento, Italy.
October 2019	**Seminar**, *Worden K.; GardnerP.; Bull L. Gosliga J.*, Structural Health Monitoring: a Machine Learning perspective, Politecnico di Torino, Italy.
May 2019	**Congress**, *WTC 2019*, Delegate student at 45th ITA-AITES General Assembly and World Tunnelling Congress, Naples, Italy.

PROFESSIONAL QUALIFICATIONS

Dec 2020 – Feb 2021	**Training Course**, *Safety and Health Coordinator in Construction Projects*, pursuant to Art. 98 Legislative Decree no. 81/08 and subsequent amendments. Studio Gamma S.a.s., Milan, Italy. Certificate register: S/C14259.
September 2020	**State Examination for the exercise of the Engineer profession**, *Section A*, Politecnico di Torino, Italy, VAT NUMBER: 01272540863. Membership: Professional Institution of Engineers, n° A827 from September 25th, 2020.

LANGUAGE SKILLS

Italian	Mother-tongue
English	C1
French	B1

INFORMATION TECHNOLOGY SKILLS

Coding	Matlab, Python (pytorch, sklearn, gpytorch, numpy, scipy)
Office	MS Office (Excel, Word, Powerpoint)
Other	LaTeX

(Dr. Alessio Faraci)