ALBERTO CIAMPAGLIA

Ph.D./Mechanical Engineering

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EXPERIENCE

Postdoctoral researcher

Politecnico di Torino

Feb 2023 - currently

- Advanced modelling and characterization of AFA steels for nuclear applications
- Data-driven methods to assess the fatigue response of additive manufactured metals
- Mechanistic data science method to accelerate the modelling of composite materials with multiscale apporaches

Pre-doctoral visiting researcher

Northwestern University

May 2021 - Jun 2022

- Concurrent multi-scale simulation with data-driven reduced order models of composite structure with woven ad uni-directional fibers
- Mechanistic data science algorithm for material laws discovery from experimental Digital Image Correlation data
- Multimodal integration of experimental and artificial data for active learning material law under multiaxial stress
- Teaching Assistant for Mechanistic Data Science and Deep Learning Discrete Calculus courses
- Proposal submission for Air Force Reasearch Lab, Navy and NSF calls in the field of structure-property prediction of composite materials

PhD Fellow

Department of Mechanical Engineering, Politecnico di Torino

Apr 2019 - Jan 2023

- Numerical analysis of composite structures under quasi-static and dynamic loads in non-linear field with in-house code and commercial software
- Study and test of optical sensor integrated in laminated structure for shape and damage sensing
- Data-driven Structural Health Monitoring System for damage sensing and failure prediction: design and test
- Development of multi-functional self-sensing composite material for strain sensing and health monitoring
- Design, optimization, manufacturing and testing of an origami-shaped composite crash box
- Proposal submission for Horizon Europe call on data driven integrated characterization and modeling methodology for composite crash structures

EDUCATION

PhD Mechanical Engineering

Politecnico di Torino
Northwestern University

2019 – 2023

Specializing Master in Innovative products and technologies for automotive suspensions

Politecnico di Torino and Marelli

Jan 2018 – Mar 2019

M.S. in Mechanical Engineering

Politecnico di Torino (110/110)

Oct 2015 – Jan 2017

SOFTWARE/PL

LS Dyna
Altair Hyperworks
Abaqus

MS Office
MatLab
Python
LabView

RESEARCH PROJECTS

Data-Driven Physics-Based Modeling Tools to Determine Effective Mechanical Properties of As-Built Composite Structures
Navy SBIR, Northwestern University

Damage detection in composite suspension
Principal Investigator, funded by Marelli Ride Dynamics

Flexible Link Elevated Compliance Suspension(FLECS) lightweight design
Project engineer, Marelli Ride Dynamics

Junior Researcher

CARS - Center for Automotive Research and Sustainable mobility

Jan 2020 - currently

- Multidisciplinary research project on smart structures for lightweight vehicles
- Active research collaborations with OEM and Tier I automotive companies

Innovation Engineer

Marelli

Jan 2018 – Mar 2019 Torino, ITA

- Research on innovative materials, processes and technologies. Specialist in design and structural analysis of composite material components
- Project leader for "Flexible Link and Elevated Compliance suspension material replacement"
- Digital coupling of RTM and Injection molding processes with resultant micro-structure
- Virtual validation of carbon fibre epoxy suspension system with 40 % mass decrease respect to previous design

PUBLICATIONS

Journal Articles

- A. Ciampaglia, e. a. (2023). Data driven method for predicting the effect of process parameters on the fatigue response of additive manufactured alsi10mg parts. *International Journal of Fatigue*.
- Centola A., e. a., Ciampaglia A. (2023). Machine learning methods to predict the fatigue life of selectively laser melted ti6al4v components. *Fatigue Fracture of Engineering Materials Structures*.
- A Ciampaglia, e. a. (2021). Impact response of an origami-shaped composite crash box: Experimental analysis and numerical optimization. *Composite Structures*, *256*.
- A. Ciampaglia, e. a. (2021). Artificial intelligence for damage detection in automotive composite parts: A use case. *SAE Technical papers*.
- A Ciampaglia, A. S., & Belingardi, G. (2020). Design and analysis of automotive lightweight materials suspension based on finite element analysis. *Proceedings of the Istitution of Mechanical Engineers. Part C, Journal of Mechanical Engineering Science*.

Conference Proceedings

- A Ciampaglia, e. a. (2020). Impact response of an origami-shaped composite crash box: Experimental analysis and numerical optimization. In *Joint event: Iccs23 - 23rd international conference on composite structures mechcomp6 - 6th international conference on mechanics of composites*, UFP.
- Ciampaglia, A. (2020). Machine learning for damage sensing in composite structures. In *Machine learning in science and engineering, poster session*, Columbia Data Science Institute, Columbia University of New York.
- Ciampaglia, A., & Belingardi, G. (2019). Combined classification and regression artificial neural network for structural health monitoring of automotive suspension. In *Automotive in ai era*, Altair Engineering.

RESEARCH TOPIC

Composite structures | Material mechanic | Finite Element Analysis | Multiscale | Structural Monitoring | Machine learning

LANGUAGES

Italian
English
Spanish

REFEREES

Prof. Giovanni Belingardi, former PhD Advisor

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Ing. Andrea Santini

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COURSES AND CERTIFICATIONS

Relevant coruses

- Advances in Experimental mechanic, AIAS PhD Summer School, 2020
- Virtual Manufacturing and Testing of composites, N. Zobeiry and R. Vaziri, British Columbia, 2019
- Structural and Computational Mechanics Modeling of Multilayered Composite and Sandwich Beam, Plate, and Shell Structures, A. Tessler, NASA, 2019
- Crash of composite structures, LS-Dyna Dynamore, 2017
- Innovation4Change, CERN 20 weeks innovation program for selected PhDs and MBAs

Certifications

- IELTS 7.0, British Council, 2017
- EY Next Car Innovation Challenge award, 2018

LIFE PHILOSOPHY

"I can accept failure, but I can not accept not trying."