Andrea Chiocca

Researcher in machine design (research contract)

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Research profile

Structural integrity and fatigue assessment of notched and welded components, combining computational mechanics, analytical methods and experimental testing.

Academic and research experience

2026-01 - present | Researcher in machine design (research contract)

Department of Civil and Industrial Engineering, University of Pisa. Research on the structural integrity of notched and welded components.

2025-02 - 2026-01 | Research fellow

Department of Civil and Industrial Engineering, University of Pisa. Assessed static and fatigue properties of thermoplastic and thermoset composites at different temperatures, and self-piercing riveted joints.

2022-02 - 2025-01 | Fixed-term researcher in machine design (RTDa)

Department of Civil and Industrial Engineering, University of Pisa

2022-02 - 2025-01 | Industrial research collaborator

Pierburg Pump Technology Italy S.p.A., Rheinmetall

2021-02 - 2021-06 | Doctoral research visit, Component-Related Material Behavior Group

Fraunhofer LBF

2018-07 - 2018-09 | Junior research assistant, Structural Durability Group

Fraunhofer LBF

2017-12 - 2018-05 | Student Intern in the Structural Durability Group

Fraunhofer LBF

Education

2021 | PhD in Industrial Engineering - University of Pisa

2018 | Master in Mechanical Engineering - University of Pisa

2015 | Bachelor's degree in Mechanical Engineering - University of Pisa

Qualifications

2024-11 | Italian National Scientific Qualification for associate-professor functions, sector 09/A3

2018-12 | Qualification to practise as an industrial engineer

Research and teaching

International responsibilities

Co-Leader of Working Group 3 (Fatigue Estimation Competition), COST Action CA23109 - Fatigue Benchmark Repository (FABER).

FABER Working Group 3

Selected collaborative projects

2025 - 2025 | Hybrid joints for lightweight vehicle structures (PRIN PNRR 2022)

Project team member: experimental characterisation, theoretical modelling and CAE simulation of joints between dissimilar metals.

2022 - 2024 | Extrusion-based additive manufacturing of metal and ceramic components (PRA 2022)

Project co-lead. University of Pisa research project on additive manufacturing process optimisation.

International research visits

June 2026: Czech Technical University in Prague, FABER WG6.

January 2026: Aarhus University, Circle U. mobility.

July 2024: NTNU, Erasmus+ research mobility.

February-June 2021: Fraunhofer LBF, doctoral research on additively manufactured components.

Teaching at the University of Pisa

2021-2024 | Mechanical Design using the Finite Element Method (923II), Energy Engineering

Course lecturer; 30 lecture hours.

2018-2026 | Machine Design (231II), Aerospace Engineering

Co-teaching; 15 hours of practical sessions.

2024-2026 | Computer-aided Design Laboratory (2167Z), Mechanical and Production Techniques

Co-teaching; 24 lecture hours.

2024-2026 | Machine Design (PF60, A042), secondary-school teacher training

Course lecturer; 10 lecture hours.

Supervision and mentoring

Supervision and co-supervision of master's theses on welded joints, composites, SPR joints, additively manufactured aluminium, elastomers and automotive PCB assemblies. Mentoring of a FABER short-term scientific mission involving ENIM, August-October 2026.

Selected scientific contributions

Representative publications

Fatigue Assessment of Welded Joints Subjected to Multiaxial Loading Conditions through the Effective Critical Plane Approach

Chiocca, Andrea; Frendo, Francesco (2026).

10.1111/ffe.70429

Temperature Effect on Fatigue Performance of Thermoset and Thermoplastic Composites

Chiocca, Andrea; Sgamma, Michele; Franceschini, Alessandro; Vestri, Alessio; Mancini, Simone; Bucchi, Francesco; Frendo, Francesco; Squarcini, Raffaele (2025).

10.4271/2025-32-0006

Application of the Effective critical plane approach for the fatigue assessment of ductile cast iron under multiaxial and non-proportional loading conditions

Chiocca, Andrea; Pedranz, Matteo; Zanini, Filippo; Carmignato, Simone; Fontanari, Vigilio; Benedetti, Matteo; Frendo, Francesco (2025).

10.1016/j.ijfatigue.2024.108716

Fatigue assessment of structural components through the Effective Critical Plane factor

Chiocca, Andrea; Frendo, Francesco (2024).

10.1016/j.ijfatigue.2024.108565

Complete bibliography: andreachiocca.github.io/publications/

Research software and data

Software, benchmark participant packages and supporting research data are catalogued with access information at andreachiocca.github.io/repositories/.

Selected awards

2024 | AIAS Award - Modelling

2022 | Best PhD thesis in Industrial Engineering 2021

2020 | Ansys Hall of Fame 2020 Competition - Finalist: Top 10 Academic

2019 | Software Simulation Award

Languages

Italian: Native speaker; English: Fluent; German: Basic