



Dario Mangoni

WORK EXPERIENCE

SpaceGlass – Parma, Italy

City: Parma | Country: Italy

Consultant at SpaceGlass

[01/01/2025 – Current]

- design of pressure vessels as testing equipment
- design of multilayered glass structure for aerospace applications
- design of silicone injection machine for layered glass

Università degli Studi di Parma

University Research Assistant (Cultore della Materia)

[31/10/2019 – Current]

Research and teaching activities in Applied Mechanics with focus on Multibody Simulations and dedicated software development

Altair Engineering – Turin, Italy

City: Turin | Country: Italy

Consultant at Altair

[22/03/2024 – Current]

- consultancy on Modelica language and FMU tools
- technical assistance on simulation software and user applications

Università degli Studi di Parma – Parma, Italy

City: Parma | Country: Italy

Research Fellow (Assegnista di Ricerca)

[01/10/2023 – 30/09/2024]

Development of simulation tools (FMU) for multibody and maritime simulations

Altair Engineering

Consultant at Altair

[01/11/2019 – 30/06/2022]

Development of real-time Modelica libraries

Università degli Studi di Parma – Parma, Italy

City: Parma | Country: Italy

Research Fellow (Assegnista di Ricerca)

[15/11/2017 – 30/10/2019]

Development of Real-Time Model-Based Vehicle Dynamic Library in Modelica

EDUCATION AND TRAINING

PhD Degree

Università degli Studi di Parma [31/10/2014 – 12/03/2018]

City: Parma | Country: Italy | Level in EQF: EQF level 8

- Multibody software development (Chrono::Engine). Languages: C++14 and Fortran
- Multi-platform building tools with CMake
- HPC (Cluster) simulations
- Iterative and direct solvers; familiarity with modern math libraries such as Intel MKL and Mumps

Thesis: An Interior Point Method for Non-Smooth Multibody System Dynamics

Visiting PhD Student

INRIA Rhône-Alpes [14/05/2017 – 16/06/2017]

City: Montbonnot | Country: France | Level in EQF: EQF level 8

Interior-Point Method development and research with Prof. V. Acary

Visiting PhD Student

SBEL Labs - University of Wisconsin [30/08/2016 – 02/10/2016]

City: Madison | Country: United States | Level in EQF: EQF level 8

Development of MUMPS module for dynamic simulation software Chrono

Visiting PhD Student

SBEL Labs - University of Wisconsin [03/09/2015 – 15/10/2015]

City: Madison | Country: United States | Level in EQF: EQF level 8

Development of Intel MKL module for dynamic simulation software Chrono

Mechanical Engineering - Master Degree

Università degli Studi di Parma [16/01/2012 – 14/07/2014]

City: Parma | Country: Italy | Level in EQF: EQF level 7

- FEA software (Abaqus, HyperMesh) and multibody (RecurDyn)
- intensive MATLAB and C coding (Matlab IDE, VisualStudio)
- Blade-element theory software (XFLR5, XRotor)
- Embedded C (CoIDE) for ARM

Thesis: development, design and prototyping of a quadcopter with dedicated Unscented Sigma-Point Kalman Filter (developed in-house from scratch), control logic and dynamic simulation in MATLAB.

Design of electronic control unit embedded in a STM32F4 ARM board.

Score: 110/110 cum laude

Mechanical Engineering - Bachelor Degree

Università degli Studi di Parma [23/09/2008 – 13/12/2011]

City: Parma | Country: Italy | Level in EQF: EQF level 6

- Software development with Matlab/Simulink tools and C embedded platforms
- Embedded boards development (digital)
- Formula SAE/ATA project for UNIPR43100 Team about the conversion of the racing engine to electronic injection. Set up of open control unit (EFI ECU).

Thesis: Hardware-in-the-loop simulation of combustion engine and its linkage to racing control unit. Score: 110/110 cum laude

Scientific High School Degree (Diploma)

Liceo Scientifico Tecnologico Bernini [30/09/2003 – 31/05/2008]

City: Fidenza | Country: Italy | Level in EQF: EQF level 4

Score: 100/100

TEACHING ACTIVITIES

[30/09/2024 – 28/02/2025]

Teaching Assistant in Applied Mechanics for the Bachelor Degree in Mechanical Engineering (a.a 2024-2025)

[30/09/2023 – 29/02/2024]

Teaching Assistant in Applied Mechanics for the Bachelor Degree in Mechanical Engineering (a.a 2023-2024)

[30/09/2022 – 28/02/2023]

Teaching Assistant in Applied Mechanics for the Bachelor Degree in Mechanical Engineering (a.a 2022-2023)

[30/09/2021 – 28/02/2022]

Teaching Assistant in Applied Mechanics for the Bachelor Degree in Mechanical Engineering (a.a 2021-2022)

[30/09/2020 – 28/02/2021]

Teaching Assistant in Applied Mechanics for the Bachelor Degree in Mechanical Engineering (a.a. 2020-2021)

[30/09/2019 – 29/02/2020]

Teaching Assistant in Robotics for the Master Degree in Mechanical Engineering (a.a. 2019-2020)

PUBLICATIONS

Publications

- **D Mangoni***, Tasora A, Peng C., *Complex Eigenvalue Analysis of Multibody Problems via Sparsity-Preserving Krylov-Schur Iterations*. Machines. 2023; 11(2):218. <https://doi.org/10.3390/machines11020218>
- **D Mangoni***, A Tasora, R Garziera, *A Primal-Dual Predictor-Corrector Interior Point Method for Non-Smooth Contact Dynamics*, Computer Methods in Applied Mechanics and Engineering
- **D Mangoni***, A Tasora, S Benatti. *Interior-Point Solver for Non-smooth Multi-Body Dynamics with Finite Elements*. Multibody Dynamics 2019. Computational Methods in Applied Science, vol. 53, p. 340-347, Springer, ISSN: 1871-3033, Duisburg, Germany, doi: 10.1007/978-3-030-23132-3_41
- **D Mangoni***, A Tasora, *Solving unilateral contact problems in multibody dynamics using a primal-dual interior point method*, Proceedings of ECCOMAS 2016
- **D Mangoni***, A Soldati, *Model-based simulation of dynamic behaviour of electric powertrains and their limitation induced by battery current saturation*, International Journal of Vehicle Performance 7 (1-2), 156-169
- **D Mangoni***, A Tasora, I Yasinskaya, *High performance linear solvers for large-scale problems in multibody dynamics*, International CAE Conference 2015 Proceedings
- A Tasora, D Mangoni, S Benatti, R Garziera, *Solving variational inequalities and cone complementarity problems in nonsmooth dynamics using the alternating direction method of multipliers*, International Journal for Numerical Methods in Engineering
- C Peng, A Tasora, D Fusai, D Mangoni, *A unified analytical expression of the tangent stiffness matrix of holonomic constraints*, Computer Methods in Applied Mechanics and Engineering, Volume 419, 2024, 116667, ISSN 0045-7825, <https://doi.org/10.1016/j.cma.2023.116667>.
- A Tasora, S Benatti, D Mangoni, R Garziera, *A geometrically exact isogeometric beam for large displacements and contacts*, Computer Methods in Applied Mechanics and Engineering 358, 112635
- A Tasora, D Mangoni, S Benatti, D Fusai, *Hybrid Thin Shell Triangle Element for Multi-Flexible-Body Dynamics*, International Congress of Theoretical and Applied Mechanics, 25th ICTAM, 22-27 August 2022, Milano, Italy
- A Tasora, D Mangoni, N Robuschi, *On the Simulation of Freewheels using the Methods of Non-Smooth Dynamics*, ECCOMAS Thematic Conference on Multibody Dynamics December 12- 15, 2021, Budapest, Hungary (Accepted)

- A Tasora, D Mangoni, *A Photorealistic Rendering Infrastructure for Man-in-the-Loop Real-Time Vehicle Simulation*, SIMUL 2021, October 3-6, 2021, Barcelona, Spain (Accepted)
- M Dalboni, D Mangoni, A Soldati, F Corradini, A Tasora, F Savi, D Lusignani, *A Fast and Lightweight Dynamics Model Oriented to Electric Vehicle Design*, IECON 2017 - 43rd Annual Conference of the IEEE Industrial Electronics Society Proceedings
- M Dalboni, D Mangoni, D Lusignani, A Soldati, *Lightweight Dynamic Vehicle Models Oriented to Vehicle Electrification*, International Journal of Vehicle Performance
- A Tasora, D Mangoni, D Negrut, R Serban, P Jayakumar, *Deformable soil with adaptive level of detail for tracked and wheeled vehicles*, International Journal of Vehicle Performance
- S Benatti, A Tasora, D Fusai, D Mangoni, *A Modular Simulation Platform for Training Robots via Deep Reinforcement Learning and Multibody Dynamics*, Proceedings of the 2019 3rd International Conference on Automation, Control

***corresponding author/conference speaker**

Link: <https://scholar.google.gr/citations?user=z1jqp7oAAAAJ&hl=it>

NETWORKS AND MEMBERSHIPS

Memberships

- Member of the Organizing Committee of the Multibody Summer School (2021)
- Member of the Organizing Committee of the Multibody Summer School (2019)
- Member of the Scientific Committee of the Chrono&MBDyn User Meeting (2017)
- Member of the Organizing Committee of the 1st Multibody Summer School (2016)

CONFERENCES AND SEMINARS

[12/07/2025 – 18/07/2025] Innsbruck

Speaker at ECCOMAS 2025

Parallelization of a multi-flexible-body framework on distributed memory architectures using MPI

Link: <https://www.uibk.ac.at/en/congress/multibody2025/>

[02/06/2025 – 06/06/2025] Como

Invited Speaker at Multibody Summer School 2025

Link: <http://multibodysummerschool.eu/index.html>

[03/06/2024 – 07/06/2024] Parma

Invited Speaker at Multibody Summer School 2024

Link: http://multibodysummerschool.eu/old_2024/index.html

[11/09/2023 – 15/09/2023] Como

Invited Speaker at Multibody Summer School 2023

Link: http://multibodysummerschool.eu/old_2023/index.html

[24/07/2023 – 28/07/2023] Lisbon

Speaker at ECCOMAS 2022

A Sparse Constrained Krylov-Schur Eigenvalue Solver for the Aeroelastic Stability Assessment of Multi-Flexible-Body Systems

Link: <https://multibody2023.tecnico.ulisboa.pt/>

[12/09/2022 – 16/09/2022] Milano

Invited speaker at Multibody Dynamics Workshop 2022

[20/05/2019 – 24/05/2019] Parma

Invited speaker at Multibody Summer School 2019

[16/05/2019 – 16/05/2019]

PhD Course Seminar on Numerical Optimization

[07/10/2019 – 11/10/2019]

Speaker at ATC Conference Detroit 2019

[09/09/2019 – 12/09/2019]

Speaker at ATC Conference Tokyo 2019

[01/12/2018 – 07/12/2018] Madison - Wisconsin

Speaker at Machine-Ground Interaction Consortium 2018

[04/06/2016 – 08/06/2016] Crete

Speaker at ECCOMAS 2016

[14/07/2019 – 18/07/2019] Duisburg - Germany

Speaker at ECCOMAS 2019

[19/10/2015 – 20/10/2015]

Speaker at International CAE Conference 2015

TITLES

[01/01/2016 – 01/01/2016]

Professional Industrial Engineering Qualification (Section A)

Professional Engineering Qualification in Industrial Engineering (Sect. A)

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

English

LISTENING C1 READING C1 WRITING C1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

JOB-RELATED SKILLS

Job-related skills

- static and dynamic structural analysis with modern software tools (Abaqus, RecurDyn)
- mechanical design (OnShape, SolidWorks, Autocad Inventor)
- combustion engine control systems
- good knowledge of embedded systems gained during both academic and personal projects involving ARM based microcontrollers
- complex software architecture and building systems

ORGANISATIONAL SKILLS

Organisational skills

- excellent team-leading skills in small as well as in big groups, gained as person in charge for scout activities (involving from tens to hundreds people)
- autonomy acquired as occasional IT consultant for Agri-Eco Srl
- good cooperativity in team-works gained as member of developers teams (Chrono::Engine), extra-curriculars activities (SAE team) as well as multi-disciplinary teams in academy