

Andrea Brugnoli

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Academic Positions

University of Twente

Post-Doctoral researcher

Numerical methods for coupled port-Hamiltonian fluid-structure dynamics
ERC Advanced grant. Principal investigator: Stefano Stramigioli

Enschede

November 2020–November 2022

Education

ISAE-Supaero

PhD in Automatic Control

A port-Hamiltonian formulation of flexible structures: modelling and symplectic finite element discretization.

Supervisors: Daniel Alazard, Valérie Pommier-Budinger and Denis Matignon.

PHD thesis prize 2021 from the ISAE-SUPAERO fondation.

Toulouse

2017–2020

Université Paris Saclay/ Supélec

Research Master in automatics and image processing

Courses: inverse problem, advanced dynamics of flexible structures, parameter estimation.

Paris/Toulouse

2016–2017

ISAE-Supaero

Double degree in aerospace and aeronautical engineering

Specialisation in applied mathematics and advanced automatics: multidisciplinary optimisation, high performance computing, control of flexible structures.

Toulouse

2015–2017

Politecnico di Milano

Master in space engineering, 110/110 cum laude

Courses: orbital mechanics, structural dynamics and control, thermochemical propulsion.

Milan

2014–2017

Politecnico di Milano

Mechanical Engineering Degree, 110/110 cum laude

Courses: finite element method, mechanical vibrations, numerical methods for engineering.

Milan

2011–2014

Experiences

ITA-Instituto Tecnológico de Aeronáutica

Visiting researcher

Collaboration with Flavio Cardoso-Riberio on numerical methods for port-Hamiltonian systems.

São José dos Campos

January 2019, 4 months

CNES-Centre des études spatiales

Internship

Analysis of dismissed satellites subjected to solar pressure to identify stable pointing configurations and periodical behaviours.

Toulouse

2017, 6 months

Politecnico di Milano in partnership with Danieli S.p.A

Bachelor project

Dynamics of a forging manipulator: kinematics modelisation and dynamic analysis. Our project was selected for a final presentation at Danieli.

Milan

2014, 3 months

Languages

Italian: native speaker
English: fluent (Toeic 965/990)
French: fluent
Spanish: intermediate
Brazilian portuguese: intermediate

Computer skills

Softwares and platforms: Simulink, Abaqus, Inventor, Solid Works, Labview
Languages: Python (especially FEM librairies: FEniCS and Firedrake), Matlab, Java, C, \LaTeX
OS: Linux environment (Fedora, Ubuntu)

References

Denis Matignon

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Paul Kotyzca

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Daniel Alazard

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Laurent Lefèvre

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Université de Grenoble Alpes, LCIS
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Publications

International conferences.....

- [1] A. Brugnoli, D. Alazard, V. Pommier-Budinger, and D. Matignon. Partitioned finite element method for the Mindlin plate as a port-Hamiltonian system. In *3rd IFAC Workshop on Control of Systems Governed by Partial Differential Equations CPDE 2019*, pages 88 – 95, Oaxaca, MX, 2019. <https://doi.org/10.1016/j.ifacol.2019.08.016>.
- [2] A. Brugnoli, D. Alazard, V. Pommier-Budinger, and D. Matignon. Interconnection of the Kirchhoff plate within the port-Hamiltonian framework. In *Proceedings of the 59th IEEE Conference on Decision and Control*, Dec 2019.
- [3] F. L. Cardoso-Ribeiro, A. Brugnoli, D. Matignon, and L. Lefèvre. Port-Hamiltonian modeling, discretization and feedback control of a circular water tank. In *Proceedings of the 59th IEEE Conference on Decision and Control*, Dec 2019.
- [4] A. Brugnoli, F. L. Cardoso-Ribeiro, G. Haine, and P. Kotyzca. Partitioned finite element method for power-preserving structured discretization with mixed boundary conditions. Accepted for the 21st IFAC World congress, Jul 2020.
- [5] A. Brugnoli, D. Alazard, V. Pommier-Budinger, and D. Matignon. Structure-preserving discretization

of port-Hamiltonian plate models. Accepted for the 24st International Symposium on Mathematical Theory of Networks and Systems, Aug 2021.

Interests

Tutor of mathematics and physics for bachelor students.

Lindy Hop, tennis, travelling, literature and cinema.