

Professor Dario Richiedei was born in Asolo (TV), Italy, on September the 18th, 1978.

EDUCATION AND ACADEMIC POSITIONS

April 2003: he received the Master Degree (cum laude) in Engineering Management at the University of Padova.

July 2003: he received the Engineer qualification - abilitazione all'esercizio della professione di Ingegnere.

March 2008: he obtained the Ph.D in Industrial Engineering, curriculum Mechatronics and Industrial Systems, at the University of Padova (Italy)

October 2008: he became assistant professor of Mechanics of Machines (ING-IND/13) at the DTG (in Vicenza) of University of Padova.

Since October 2014 he is Associate Professor of Mechanics of Machines at the DTG of the University of Padova.

April 2017: he received the Italian scientific qualification ASN for the role of full professor in Mechanics of machines.

TEACHING ACTIVITIES

Since Academic Year 2008-2009, he has been teaching the following courses (21 courses) at the master and bachelor degree programs in engineering of the Padova University: Multibody system dynamics, Mechanics of Machines, Laboratory of Mechanics, Control of mechanical systems. Since Academic Year 2010, he has been teaching courses at the Mechatronics and Product Innovation Engineering PhD School (University of Padova) on advanced topics of vibration mechanics and computational methods for mechanics.

MAIN SCIENTIFIC ACTIVITIES

Researches include theoretical and experimental investigations in mechanics of machines and mechatronics by proposing new and rigorous model-based approaches and using advanced mathematical tools. Experiments are adopted to validate them. Three main areas can be defined, that share models and approaches and are consistent with the project goals since they handle different issues for attaining high-performances systems.

<i>1 MODELING OF MULTIBODY AND VIBRATING SYSTEMS</i>: this research is functional to design and control since it provides reliable models.

- * Dynamic modeling of flexible mechanisms
- * Model reduction in vibrating systems for real-time applications and model-based design
- * Design of state observers (piecewise linear, nonlinear) for rigid/flexible mechanisms based on dynamic (full-order, reduced order) or kinematic models

<i>2 ACTIVE AND PASSIVE CONTROL OF VIBRATING SYSTEMS</i>: this research aims at increasing performances of vibrating systems through various approaches.

- * Dynamic structural modification of vibrating systems
- * Active control of lightweight mechanisms through state or estimated state
- * Hybrid control, concurrent active+passive, for eigenstructure assignment

- * Delayed reference control of linear systems
- * Motion planning in vibrating systems (linear, nonlinear) through variational robust approaches
- * Model-based filtering and sensor fusion of load cells
- * Model-based control of system with oscillating dynamics (e.g. web tension control, hydraulic actuators)

3 DESIGN OF HIGH-PERFORMANCE MECHATRONIC SYSTEMS: this applied research activity focuses on the application of new and emerging methods in various mechatronics applications

- * Energy efficient motion planning in rigid-body mechatronic systems (automatic machines, robots)
- * Model-based approaches for integrated optimal selection of components (motor, gearbox, ball-screw, drive)
- * Design of devices and sensor fusion algorithms for medical applications.

PUBLICATIONS

Prof. Richiedei is author of about 80 papers, published on international journals or conference proceedings (in almost all the papers, alphabetical order of authors is used). It should be mentioned that he is currently author of 35 papers published by ISI (WOS) indexed journals. Average number of authors: 2.9. Other 2 papers are published by journal indexed by Scopus. Most of these articles are published in Q1 Journals according to JCR2016 (WOS): Mechanical Systems and Signal Processing (5 papers), Multibody System Dynamics (3), Mechatronics (3), International Journal of Mechanical Sciences (2), ASME Journal of Mechanical Design (2), Journal of Sound and Vibration (2), Robotics and Computer-Integrated Manufacturing (2). Half of these papers have also experimental results, besides the theoretical ones therein proposed.

COLLABORATIONS WITH INTERNATIONAL RESEARCH GROUPS

The research of Prof. Richiedei is developed in partnership with scholars from international universities, as corroborated by some papers.

- * Prof. Huajiang Ouyang, full Professor of the Liverpool University (GB): development of techniques for structural modification of vibrating systems and for active vibration control.
- * Prof. Javier Cuadrado, Escuela Politecnica Superior- University of La Coruña (E), full Professor, chair of the IFTOMM Committee for Multibody Dynamics: development of nonlinear Kalman filters for state estimation in multibody systems.
- * Dr. Roland Pastorino, University of La Coruña - KU Leuven (BE): development of nonlinear Kalman filters for state estimation in multibody systems.
- * Prof. William O'Connor, University Dublin College (IRL): vibration control in flexible systems through wave-based approaches.
- * Prof. Jin-Gyun Kim, Mechanical Systems Safety Research Division, Korea Institute of Machinery and Materials: model reduction in vibrating systems through enhanced Craig-Bampton methods.

Prof. Richiedei also collaborates with the University of Bozen (Dr. Palomba, Dr. Belotti) in researches dealing with the topics of this project.

Another relevant collaboration is with the Nephrology Research Group of the Vicenza Hospital (Prof. C. Ronco) in the development of wearable mechatronics medical devices.