

energy based modeling and control

lecturers

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objectives

TBA

contents

Physical systems, from mechanical, electrical, electro-mechanical, to thermal and chemical domains, share common structures, with energy and power flow their 'lingua franca'. In this 4-week course we will introduce the basic concepts for port-based modeling of (interconnected, possibly large-scale) physical systems, leading to the geometric theory of port-Hamiltonian systems. Emphasis will be on the use of such models for (often nonlinear) control. Main application areas to be addressed are robotics and power networks.

course material

The course will be based on selected chapters of the following publications of lecture note type (pdf's of which will be made available to the students):

- G. Folkertsma, S. Stramigioli, Energy in robotics, now publishers 2017.
- A.J. van der Schaft, D. Jeltsema, Port-Hamiltonian systems theory: an introductory survey, now publishers 2014.

prerequisites

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homework assignments

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