

Einladung

**Am Montag, 27.10.2014, 14.30 Uhr, findet
in Gebäude C 7 4, Konferenzraum, ein Vortrag**

von

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zum Thema

Approximate Steering of Rotating Elastic Structures

statt.

The approximate steering problem is considered in this talk for a linear distributed parameter system with finite-dimensional control. An approach for solving this problem is proposed by using exact solutions of the steering problem for reduced systems and the spillover analysis. This approach allows also to estimate the reachable sets and to study the approximate controllability. To satisfy the spillover condition, we exploit L_2 -optimal controls for a family of finite-dimensional subsystems. These controls are constructed explicitly for a system of oscillators with one-dimensional input. As a result, we obtain sufficient conditions for the approximate controllability in terms of the distribution of eigenfrequencies in such system. These conditions are applied for the approximate controllability study of a rotating body-beam system.

The above family of optimal controls is also applied for a mechanical system consisting of a rotating rigid body and the Kirchhoff plate. We derive the equations of motion of this system with modal coordinates by assuming that the control is the angular acceleration of the body. The linearized control system is shown to be neither controllable nor stabilizable in general case. We propose a state feedback control that ensures partial asymptotic stability of this system. An infinite-dimensional subsystem corresponding to the modes with odd indices is shown to be approximately controllable under an additional assumption that the ratio of sides of the rectangular plate is an irrational algebraic number. The connection of this result to Liouville's theorem is discussed.

Alle Interessenten sind herzlich eingeladen.

Prof. Dr.-Ing. habil. J. Rudolph