Einladung zum

Würzburger Mathematischen Kolloquium

Julius-Maximilians-Universität Würzburg • Fakultät für Mathematik und Informatik

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Some methods to take advantage of nonlinearities to control a system

Mittwoch, der 8. Jan. 2020 • 16:15 Uhr

Raum SE 40, Mathematik Ost, Emil-Fischer-Str. 40, Campus Hubland-Nord

Inhaltsangabe:

A control system is a dynamical system on which one can act thanks to what is called the control. For example, in a car, one can turn the steering wheel, press the accelerator pedal etc. These are the control(s). One of the main problems in control theory is the controllability problem, which is the following one. One starts from a given situation and there is a given target. The controllability problem is to see if, by using some suitable controls depending on time, the given situation and target, one can move from the given situation to the target. We study this problem with a special emphasis on the case where the nonlinearities play a crucial role. In finite dimension in this case a key tool is the use of iterated Lie brackets as shown in particular by the Chow theorem. This key tool gives also important results for some control systems modeled by means of partial differential equations. However we do not know how to use it for many other control systems modeled by means partial differential equations. We present methods to avoid the use of iterated Lie brackets. We give applications of these methods to the control of various physical control systems (Euler and Navier-Stokes equations of incompressible fluids, 1-D hyperbolic systems, heat equations, shallow water equations, Korteweg-de Vries equations, Schroedinger equations...) and to the stabilization problem, another of the main problems in control theory.

Zu diesem Vortrag laden wir Sie herzlich ein.
Im Anschluss an den Vortrag stehen Tee und Kaffee im Foyer vor dem SE 40 bereit.

Die Dozentinnen und Dozenten der Mathematik