



Einladung zum Oberseminar Dynamische Systeme und Kontrolltheorie

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Noncommutative function theory, noncommutative rational functions, and their realization theory

Noncommutative (nc, for short) functions of d variables are functions of d tuples of square matrices of all sizes that are graded (i.e., preserve the size of matrices) and satisfy natural compatibility conditions (preserve direct sums and joint similarities). It turns out that nc functions admit a good differential calculus and possess very strong regularity properties (roughly local boundedness implies analyticity). Their study was initiated in a pioneering work of Taylor in the 1970s (in the framework of noncommutative spectral theory); after lying dormant for some time, the topic saw a rapid development in the last 15 years, revealing both a deep theory that is sometimes analogous and sometimes radically different from the classical function theory of several complex variables and important relations and applications to other areas (operator spaces, free probability, free rings and their fields of fractions, linear matrix inequalities for dimension independent problems in systems and control).

In this talk I will give a general introduction to nc function theory. I will then discuss nc rational functions and their state space realizations which go back to the work of Kleene and Schutzenberger in formal languages and finite automata in the 1960s. The talk will be directed at a general mathematical audience and should be accessible to graduate students.

Ort: Mathematik Ost, Seminarraum SE 40

Zeit: Freitag, 17.05.2024 14:00

Zu diesem Vortrag laden wir Sie herzlich ein.

gez. Sergey Dashkovskiy