Title: The moment sum-of-squares hierarchy in dynamical systems and control: basics and new developments

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Abstract: This talk will give an overview of the applications of the moment-sum-of-squares hierarchy in the fields of dynamical systems and control. We will explain how a number of problems such as optimal control, region of attraction or invariant set computation can be cast as linear programming problems in the space of Borel measures and how these linear programs can be approximated using the moment-sum-of-squares hierarchy of semidefinite programming problems with guaranteed convergence. The talk will finish by describing how the approach can be used in a situation where only an uncertain model is available in conjunction with measured data, leading to methods that provide guaranteed data-consistent estimates in this setting.