Abstract:

Model reduction is an ubiquitous tool in analysis and simulation of dynamical systems, control design, circuit simulation, structural dynamics, CFD, etc. In the past decades many approaches have been developed for reducing the order of a given model. Often these methods have been derived in parallel in different disciplines with particular applications in mind. We will discuss some of the most prominent methods used for linear systems, compare their properties and highlight similarities. In particular, we will emphasize the role of recent developments in numerical linear algebra in the different approaches. Efficiently using these new techniques, the range of applicability of some of the methods has considerably widened. The performance of several approaches will be demonstrated using real-world examples from several disciplines.