

# System-Theoretic Model Order Reduction in pyMOR

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## Abstract

In this work, we discuss model order reduction for control systems using pyMOR, a freely available software library of model order reduction algorithms implemented with the Python programming language. The initial focus of pyMOR was on reduced basis methods for parameterized partial differential equations. As such, it was designed to allow seamless integration with existing partial differential equation solvers packages, e.g., deal.II, DUNE, or FeniCS. In particular, all reduction algorithms in pyMOR are implemented generically via operations on well-defined vector array, operator, and model interface classes. We discuss the pyMOR implementation of system-theoretic model order reduction algorithms, e.g., balanced truncation and iterative rational Krylov algorithm, and present the partial differential equation solver integration on several benchmark examples.

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