RATIONAL APPROXIMATION FOR DATA-DRIVEN MODELING AND COMPLEXITY REDUCTION OF LINEAR AND NONLINEAR DYNAMICAL SYSTEMS (MS - ID 69)

On improving the data collection step for data driven modeling methods

Karim Cherifi
TU Berlin
cherifi@math.tu-berlin.de
Pawan Goyal
MPI Magdeburg, Germany
goyalp@mpi-magdeburg.mpg.de
Peter Benner
MPI Magdeburg, Germany
benner@mpi-magdeburg.mpg.de

Data-driven modeling methods have gained in popularity in recent years. However, to obtain good reliable models, one generally needs to process a huge amount of data. In this work, we present a heuristic algorithm to improve the data collection step such that the data used is only the data that holds the most information about the system that we are trying to model. This algorithm is applied on the Loewner framework where interpolation points are chosen adaptively in order to obtain a reliable low order realization of the system at hand. It is designed for frequency domain data then extended to time domain data. The operation of the algorithm is illustrated by applications and well known benchmarks.