

The AAA algorithm - some ideas, extensions, and challenges

The scope of this contribution is to address some theoretical and numerical aspects concerning the AAA (Adaptive Antoulas-Anderson) algorithm for rational approximation. This method was introduced in 2018 by Nakatsukasa, Sete, and Trefethen and it is based on an interpolation scheme proposed by Antoulas and Anderson in 1986. The AAA algorithm can be viewed as a data-driven iterative procedure for fitting rational functions to a set of measurements. At the same time, it can be used as a MOR technique (the to-be fitted rational function is the transfer function of the ROM). In this talk, we address such issues as pole sensitivity for the AAA models, connections to the Loewner framework (introduced by Mayo and Antoulas in 2007), and possible extensions for the special case for which derivative information is also available. For the latter, we present ways of adapting AAA to cope with Hermite interpolation.

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