A REAL TIME PROCEDURE FOR AFFINELY DEPENDENT PARAMETRIC MODEL ORDER REDUCTION USING INTERPOLATION ON GRASSMANN MANIFOLDS

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TÓM TẮT:

Model order reduction helps to reduce the computational time in dealing with large dynamical systems, for example, during simulation, control, optimization. In many cases, the considered model depends on parameters; Model order reduction techniques are, therefore, preferred to symbolically preserve this dependence or to be adaptive to the change of the model caused by the variation in the values of the parameters. In this paper, we first present the application of the interpolation technique on Grassmann manifolds to this problem. We then improve the method for the models whose system matrices depend affinely on parameters by considerably reducing the computational complexity on the basis of analyzing the structure of sums of singular value decompositions and decomposing the whole procedure into offline and online stages. A numerical example is shown to illustrate the method as well as to prove its effectiveness.