Εβδομαδιαίο Σεμινάριο

Computing Matrix Means

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Matrix means of geometric type have been introduced on one hand because of the mathematical curiosity and on the other hand because of the demand of suitable models of matrix averages by the applications. Thus, the need of suitable algorithms for computing matrix geometric means is clear. We review the computational problems related to the matrix means. First, we consider the geometric mean of two matrices, whose explicit expression, if evaluated directly, leads to an inaccurate algorithm; for that problem, some remedies are proposed. Then, we consider the geometric mean of more than two matrices, for which no explicit expression is known, and which can be obtained just as a limit of certain sequences. We consider the different behavior of the sequences converging to the geometric mean from an algorithmic point of view, showing, in particular, the efficiency of the techniques based on the optimization in matrix manifolds.

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