

Prescribed behavior of extrapolation methods

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Abstract

When a sequence (s_n) is slowly converging, it can be transformed, by a linear or a nonlinear sequence transformation T , into another sequence (t_n) which, under some assumptions, converges faster to the same limit. Conditions for the convergence of (t_n) , and its faster convergence have been given for many transformations and many classes of sequences (see, for example, [1, 3, 4, 5, 6]).

In this talk, we discuss the inverse problem which seems to have never been treated. We study if it is possible to find the sequence (s_n) such that (t_n) has a prescribed behavior $t_n = a_n$ for all n , where (a_n) is an arbitrary sequence. The study uses two approaches namely the mathematical definition of the transformation and the recursive algorithm for its implementation.

These results show that almost any convergence behavior for a sequence transformation can be prescribed by a particular choice of the sequence (s_n) to be transformed. Some examples are given. See [2] for more details.

References

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