AN ALGORITHM WITH GUARANTEED CONVERGENCE FOR FINDING A ZERO OF A FUNCTION

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ABSTRACT

An algorithm is presented for finding a zero of a function which changes sign in a given interval. The algorithm combines linear interpolation and inverse quadratic interpolation with bisection. Convergence is usually superlinear, and is never much slower than for bisection. ALGOL 60 procedures are given.

COMMENTS

Only the Abstract is given here. The full paper appeared as [1]. For similar material see [2, Chapter 4]. Related algorithms are described in [3, 4].

REFERENCES

[1] R. P. Brent, "An algorithm with guaranteed convergence for finding a zero of a function", *Computer J.* 14 (1971), 422–425. MR 49#4234, Zbl 231.65046. rpb005.
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[3] T. J. Dekker, "Finding a zero by means of successive linear interpolation", in *Constructive Aspects of the Fundamental Theorem of Algebra* (edited by B. Dejon and P. Henrici), Interscience, New York, 1969.
[4] J. H. Wilkinson, *Two Algorithms based on Successive Linear Interpolation*, Technical Report CS 60, Computer Science Department, Stanford University, Stanford, California, 1967.

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