

Subdivision Methods in Nonlinear Algebra

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Abstract: In subdivision-based algorithms, a domain of interest is broken into small pieces which can be easily studied, individually. Such algorithms can be applied to the isolation of roots of polynomials, to approximations of curves and surfaces, as well as to homotopy continuation. When combined with tools from interval arithmetic or symbolic algebra, the output of these algorithms are guaranteed to be correct. In this introductory talk, I will introduce the tools that are used in this area and present some algorithms that have been developed using subdivision-based methods. If time allows, I will discuss current research directions as well as open questions of interest to the nonlinear algebra community.