Robust Algorithms for Chebyshev Polynomial Approximation

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Abstract

A polynomial approximation in Chebyshev sense appears in various applications (antennas, digital signal processing, etc.) The recursive algorithms for such polynomials, Zolotarev polynomials and their relatives are presented. A nonlinear first order differential equation is usually used for parametric representation of these polynomials. We show that the second order differential equation can be derived correspondingly, which is linear and possess iterative solution. The recursive algorithm are found for Chebysev expansion of each polynomial and its numerical robustness is demonstrated.