

Bernstein Type Polynomials for Solving Differential Equations and Their Applications

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Abstract : In this paper, we study the Bernstein-type basis functions with their generating functions. We give various properties of these polynomials with the aid of their generating functions. These polynomials and generating functions have many valuable applications in mathematics, in probability, in statistics and also in mathematical physics. By using the Bernstein-Galerkin and the Bernstein-Petrov-Galerkin methods, we give some applications of the Bernstein-type polynomials for solving high even-order differential equations with their numerical computations. We also give Bezier-type curves related to the Bernstein-type basis functions. We investigate fundamental properties of these curves. These curves have many applications in mathematics, in computer geometric design and other related areas. Moreover, we simulate these polynomials with their plots for some selected numerical values.

Keywords : generating functions, Bernstein basis functions, Bernstein polynomials, Bezier curves, differential equations

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