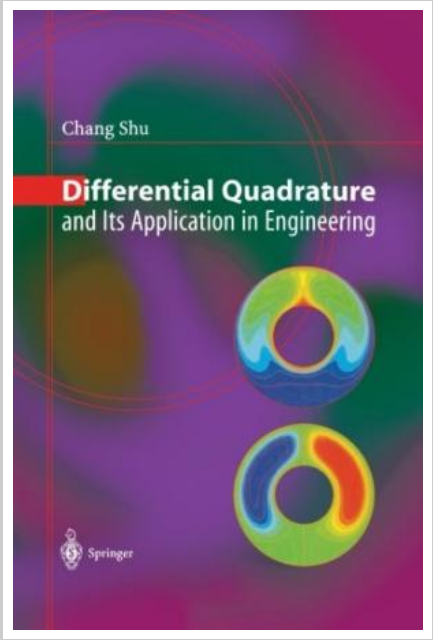

Differential Quadrature and Its Application in Engineering

By Shu, Chang

Book Condition: New. Publisher/Verlag: Springer, Berlin | Aimed at practicing engineers, scientists and graduate students, this volume provides an overview of differential quadrature and its implementation in solving problems of flow, structure and vibration. Sample programs provide readers with a better understanding of the topic, and can easily be modified to solve other engineering problems. | In the past few years, the differential quadrature method has been applied extensively in engineering. This book, aimed primarily at practising engineers, scientists and graduate students, gives a systematic description of the mathematical fundamentals of differential quadrature and its detailed implementation in solving Helmholtz problems and problems of flow, structure and vibration. Differential quadrature provides a global approach to numerical discretization, which approximates the derivatives by a linear weighted sum of all the functional values in the whole domain. Following the analysis of function approximation and the analysis of a linear vector space, it is shown in the book that the weighting coefficients of the polynomial-based, Fourier expansion-based, and exponential-based differential quadrature methods can be computed explicitly. It is also demonstrated that the polynomial-based differential quadrature method is equivalent to the highest-order finite difference scheme. Furthermore, the relationship between differential quadrature and conventional spectral...

Reviews

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