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   Soggetti   Iterative methods (Mathematics)
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   Nota di contenuto   Basic concepts -- Iterative methods without derivatives -- Generalized root iterations -- Bell's polynomials and parallel disk iterations -- Computational efficiency of simultaneous methods.

   Sommario/riassunto   The simultaneous inclusion of polynomial complex zeros is a crucial problem in numerical analysis. Rapidly converging algorithms are presented in these notes, including convergence analysis in terms of circular regions, and in complex arithmetic. Parallel circular iterations, where the approximations to the zeros have the form of circular regions containing these zeros, are efficient because they also provide error estimates. There are at present no book publications on this topic and one of the aims of this book is to collect most of the algorithms produced in the last 15 years. To decrease the high computational cost of interval methods, several effective iterative processes for the simultaneous inclusion of polynomial zeros which combine the efficiency of ordinary floating-point arithmetic with the accuracy control that may be obtained by the interval methods, are set down, and their computational efficiency is described. The rate of these methods is of interest in designing a package for the simultaneous approximation of polynomial zeros, where automatic procedure selection is desired. The book is both a text and a reference source for

mathematicans, engineers, physicists and computer scientists who are interested in new developments and applications, but the material is also accessible to anyone with graduate level mathematical background and some knowledge of basic computational complex analysis and programming.