

Explicit Iterative Methods of Second Order and Approximate Inverse Preconditioners for Solving Complex Computational Problems

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Abstract

Explicit Exact and Approximate Inverse Preconditioners for solving complex linear systems are introduced. A class of general iterative methods of second order is presented and the selection of iterative parameters is discussed. The second order iterative methods behave quite similar to first order methods and the development of efficient preconditioners for solving the original linear system is a decisive factor for making the second order iterative methods superior to the first order iterative methods. Adaptive preconditioned Conjugate Gradient methods using explicit approximate preconditioners for solving efficiently large sparse systems of algebraic equations are also presented. The generalized Approximate Inverse Matrix techniques can be efficiently used in conjunction with explicit iterative schemes leading to effective composite semi-direct solution methods for solving large linear systems of algebraic equations.

Keywords

Approximate Inverse Preconditioners, Iterative Methods, Second Order Iterative Schemes, Exact Inverse Methods, Approximate Inverse, Explicit Preconditioning, Conjugate Gradients, Convergence Analysis

1. Introduction

During the last decades, considerable research effort has been directed to the solution of complex linear and nonlinear systems of algebraic equation by using a class of iterative methods. This class includes the conjugate gradient method and its hybrid multi-variants. The conjugate gradient method originally introduced by Hestenes and Stiefel [1], was a direct solution method but later on has been extensively used as an iterative method for solving efficiently large sparse linear

Iterative Methods For Approximate Solution Of Inverse Problems

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In some sort of inundated with monitors and the cacophony of instantaneous transmission, the profound power and psychological resonance of verbal beauty frequently disappear into obscurity, eclipsed by the continuous onslaught of sound and distractions. However, located within the musical pages of **Iterative Methods For Approximate Solution Of Inverse Problems**, a captivating work of fictional brilliance that impulses with fresh emotions, lies an unforgettable journey waiting to be embarked upon. Composed by way of a virtuoso wordsmith, that interesting opus manuals visitors on a mental odyssey, lightly revealing the latent possible and profound affect embedded within the delicate internet of language. Within the heart-wrenching expanse of this evocative examination, we can embark upon an introspective exploration of the book is main themes, dissect their captivating publishing type, and immerse ourselves in the indelible effect it leaves upon the depths of readers souls.

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