University of Macau

Abstract

A Preconditioner for Symmetric Nonsingular M-Matrices

by Tam Hong Sang

Thesis Supervisor:

Prof. Jin Xiao Qing

Department of Mathematics

In this thesis, we study a new preconditioner for solving the system with symmetric nonsingular M-matrix by the preconditioned conjugate gradient (PCG) method. The PCG method is very useful when employed as an iterative approximation method for solving large sparse systems with nonzero entries occurring in predictable patterns.

We show that our preconditioner increases the convergence rate of the PCG method and reduces the operation cost.

Some numerical examples for the M-matrix systems are given.