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求解线性矛盾方程组的递推Householder变换法

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A RECURSIVE HOUSEHOLDER TRANSFORMATION ALGORITHM FOR SOLVING LINEAR OVER-DETERMINED EQUATIONS

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摘要

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摘要

求解线性矛盾方程组是工程实践中经常遇到的问题。目前主要采用法方程组解法和基于各种正交变换的三角化解法。由于法方程组系数矩阵的病态条件数是原矛盾方程组系数矩阵病态条件数的平方,所以计算精度较差,有时甚至得到完全错误的结果。因此一些计算精度要求高的问题和高阶方程组的求解,多采用三角化法。但是,三角化法只能进行一次性处理,尚未出现随数据更新的实时递推算法。许多需要在线处理和数据存储最大的问题,只好采用一般递推最小二乘法。

关键词: 实时递推算法 矛盾方程组 Householder变换

Abstract:

A Real-time Householder transformation algorithm for solving linear overdetermined equations is proposed. The algorithm is more accurate than the Traditional Recursive Least Squares Algorithm (TRLSSA) because the ill-condition is worsened by TRLSSA. Another benefit of our algorithm is that its computational time is just about $2/n$ of TRLSSA where n is the number of the unknown parameters.

Keywords: real-time recursive algorithms over-determined equations householder transformation

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