短文

非正交联合对角化的罚函数粒子群算法

徐洪涛

第二炮兵工程学院

摘要：

针对多个矩阵近似联合对角化盲分离问题, 提出一种新的非正交近似联合对角化算法. 首先采用罚函数法将联合对角化的非线性约束优化模型转化为无约束优化模型; 其次将粒子群优化算法引入无约束优化模型中实现目标函数的最优化, 从而完成矩阵组的联合对角化. 分析了惩罚因子的更新策略及算法的收敛性能, 并设计仿真实验进行对比分析以检验算法解决实际盲分离问题的能力.

关键词： 盲源分离；非正交联合对角化；惩罚函数；惩罚因子；粒子群优化

Non-orthogonal joint diagonalization based on penalty function particle swarm optimization

Abstract:

Aim to approximately joint diagonalization(JAD) method in solving blind source separation(BSS) problem,
a novel non-orthogonal JAD(NJAD) algorithm is proposed. By using the penalty function, the constrained optimization
problem of NJAD can be changed to an unconstrained optimization problem. Then the particle swarm algorithm is used to
realize the optimization of the criterion. The updated strategy of penalty factor is given and the convergence of the algorithm
is analyzed. Computer simulations show the capability of the proposed algorithm in solving the BSS problems compared to
another one.

Keywords: blind source separation；non-orthogonal joint diagonalization；penalty function；penalty factor；particle
swarm optimization

通讯作者: 徐洪涛

作者简介:

作者Email: xuhongtaoppp@163.com

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