

Problem Description

April 20, 2016

1 Introduction

In this document, we aim to detail the implementation of a Fortran project using ...

2 Problem Description

Given some matrix $P \in \mathbb{R}^{4 \times 4}$, let $x = (x_1, x_2, x_3, x_4)$, $D = \text{diag}(x)$ and $\varepsilon = (\varepsilon_{ij}) \in \mathbb{R}^{4 \times 4}$. We are interested in solving the following problem:

$$\begin{aligned} & \text{minimize} && \sum_{i=1}^4 \sum_{j=1}^4 \varepsilon_{ij}^2 \\ & \text{subject to} && x_4 = 1 \\ & && D(P + \varepsilon) \text{ must be persymmetric.} \end{aligned}$$

This can be written as the following problem:

$$\begin{aligned} & \text{minimize} && \sum_{i=1}^4 \sum_{j=1}^4 \varepsilon_{ij}^2 \\ & \text{subject to} && x_4 = 1 \\ & && x_i(P_{ij} + \varepsilon_{ij}) - x_{\alpha(j)}(P_{\alpha(j)\alpha(i)} + \varepsilon_{\alpha(j)\alpha(i)}) = 0, \\ & && \text{for } i = 1, 2, 3, j = 1, \dots, 4 - i \text{ where } \alpha(i) = 5 - i. \end{aligned}$$

3 Solving

4 Results