The eigenvalue problem solution:

But we can say that .

Note that:

Where . So we get:

And our constrains are .

Moreover, X has to be semi positive definite.

So:

Which is convex in X.

My real goal however, is:

Donate as x. I have proved on the next page that .

The problem is now:

Replace with , so our problem becomes:

Where . So we get:

And our constrains are

So:

This is not enough, however. We also need that to be decomposed later to valid rotation matrix. We can tell that .

Suppose we found , so .

y will be the eigenvector matches to this eigenvalue and we can easily restore x.

I need vector x such that when reshaped to 9x9 will be a valid rotation matrix.

I will attach proof that :

the expressions in are:

And

Let's start with none squares sum:

And continue with the squares:

Moreover, we know that

Note that the yellow part summarizes up to

Moreover, all the other expressions having the same color sum up to 0.

Therefore,