Subject: Re: help to resolve a intricate equation
Posted by James Kuyper on Sun, 09 Sep 2007 13:48:48 GMT
View Forum Message <> Reply to Message

Sven Geier wrote:
> highstone wrote:
>
>> hello all
>> there is a equation like
>> X^2+A*X=C+A
>> where X is a matrix to resolve, A is a known matrix, C is a constant
>> (actually X,A is a grid image)
>>
>> is there any method can resolve this type equation such as least-
>> squares method or others? can be based on IDL ?
>>
>> I am not well up in maths, please as particular as possible, thank
>> you.
>
>
> I am probably completely misunderstanding what you're trying to do, but...
>
> X^2 + A*X = C+A
>
> => X^2 -C = A (1-X)
>
> => A = (X^2 -C)/(1-X)

Please note that X and A are matrices; C might be as well - he wasn't clear on that point. If X^2 and A*X are to be interpreted as element-by-element multiplication of two matrices, then your approach works. However, if they refer to true matrix multiplications, then you have to do something different. If X is a square matrix, and I is the identity matrix of the same size, and if (I-X) is invertible, then what you can do is:

A = (X^2 - C)*inverse(I-X)

> but you probably meant something entirely different...

I believe so. He indicated that the value of 'A' is known; it is 'X' that he describes as "a matrix to resolve". For scalars, the quadratic equation could be used to solve such an equation; but that doesn't work with matrices. I seem to remember learning an approach that can be used, but I don't remember what it was.