
Subject: Re: Matrix rank

Posted by [d.poreh](#) on Fri, 14 Dec 2007 18:17:42 GMT

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On Dec 14, 7:06 pm, Steve Eddins <Steve.Edd...@mathworks.com> wrote:

> Vince Hradil wrote:

>> On Dec 14, 9:42 am, Wox <nom...@hotmail.com> wrote:

>>> On Fri, 14 Dec 2007 06:35:11 -0800 (PST), Vince Hradil

>

>>> <hrad...@yahoo.com> wrote:

>>>> IDL can do SVD, can you get the rank from that? Look up SVDC in the
>>>> docs.

>>> I could do this, but maybe there's a better way?

>

>>> ; A: integers

>>> ; B: floats

>>> A = [[0,0,1], \$

>>> [0,1,0], \$

>>> [0,0,0]]

>>> B = [0.25,0.5,1]

>

>>> ; Decompose A

>>> SVDC, A, W, U, V

>>> ; Solve A.X=B

>>> X=SVSOL(U, W, V, B)

>

>>> ; Check

>>> B2=A##X

>>> ind=where(total(abs(A),1,/pres) ne 0)

>

>>> if array_equal(B[ind],B2[ind]) then print,X

>

>> Well, w contains the singular values, the number of these that are non-

>> zero will be the rank:

>> idx = where(w ne 0, rank)

>> print, rank

>> 2

>

> Since this is all in floating-point, it's appropriate to use a tolerance

> instead of comparing exactly with 0. See, for example, the algorithm

> used in the MATLAB rank function, which uses a tolerance based on the

> size of the matrix and the maximum singular value. It's described here:

>

> <http://www.mathworks.com/access/helpdesk/help/techdoc/ref/rank.html>

>

> I assume this is straightforward to express in IDL.

>

> ---

> Steve Eddins<http://blogs.mathworks.com/steve/>- Hide quoted text -
>
> - Show quoted text -

but in MATLAB:

`tol = max(size(A)) * norm(A) * eps.`

why?
