Subject: More problems with singular value decomposition
Posted by Javier Sanchez Gonzal on Thu, 01 Jul 1999 07:00:00 GMT
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Hi all

I continue having problems with singular value decomposition. Now, I know how to calculate singular value of a complex matrix (A lot of thanks, Mr. Hanson) but I have a different problem.
When I calculate the singular value of a square matrix with svdc procedure, this routine return me a vector and two matrix. One of this matrix has to be the transposed conjugated of the other.
Some times I obtain this result but some other times this result is wrong.

For example:

a=(4803.65, 0.000000)(-997.981, -3071.47)(
-643.435, 467.483)
(-997.981, 3071.47)(3208.75, 0.000000)(
-634.621, -1953.16)
(-643.435, -467.483)(-634.621, 1953.16)(
2355.54, 0.000000)

svdc, a, w,u, v

u=(-0.711864, 5.69912e-017)(0.559709, 0.0649079)(
0.419240, 6.27647e-009)
(0.192054, -0.591082)(0.0947117, -0.206726)(
0.231666, -0.712995)
(0.264619, 0.192257)(0.584493, 0.537750)(
-0.414266, -0.300982)

v=(-0.711864, 5.58488e-017)(0.559709, 0.0649079)(
0.419240, 7.21748e-009)
(0.192054, -0.591082)(0.0947117, -0.206726)(
0.231666, -0.712995)
(0.264619, 0.192257)(0.584493, 0.537750)(
-0.414266, -0.300982)

u##transpose(conj(v))=(1.00000,-3.94511e-010)(4.25556e-009,
1.63115e-008)(-5.13171e-009, 8.42458e-009)
(3.58462e-009,-1.65295e-008)(
1.00000, 0.000000)(-5.16259e-009, 1.95586e-008)

(-5.41494e-009,-8.03475e-009)(-5.16259e-009,-1.95586e-008)(
1.00000, 0.000000)

but if you try the same with
a=
(2559.80, 0.000000)(-424.869, 1307.61)(
67.0270, 48.6980)(-1008.82, 732.952)(-543.192,
-1671.78)
(-424.869, -1307.61)(1043.65, 0.000000)(
-124.315, 382.602)(214.788, 156.052)(-580.926,
422.068)
(67.0270, -48.6980)(-124.315, -382.602)(
656.810, 0.000000)(-195.373, 601.295)(-313.805,
-227.993)
(-1008.82, -732.952)(214.788, -156.052)(
-195.373, -601.295)(1143.00, 0.000000)(-357.158,
1099.22)
(-543.192, 1671.78)(-580.926, -422.068)(
-313.805, 227.993)(-357.158, -1099.22)(1374.57,
0.000000)

you obtain
u##transpose(conj(v))=
(0.182996, 3.67139e-008)(-0.0236849, 0.790943)(0.179207,
-0.124324)(-0.176838, 0.215369)(0.0978060, -0.453396)
(-0.0236855, -0.790942)(0.209307, 5.32995e-007)(
0.177046, 0.263454)(-0.0648843, -0.229042)(0.415134,
-0.0166949)
(0.179206, 0.124324)(0.177046, -0.263454)(
0.472255,-6.81187e-007)(0.00313089, 0.688385)(0.344365,
0.190206)
(-0.176838, -0.215368)(-0.0648836, 0.229043)(
0.00313194, -0.688385)(-0.174798, 6.61214e-008)(
0.0446041, 0.599372)
(0.0978052, 0.453396)(0.415135, 0.0166958)(
0.344365, -0.190207)(0.0446032, -0.599371)(0.310240,
3.54110e-008)

If somebody knows the reply , please let me know.

Thanks all

Javier Sanchez Gonzalez