

Usage

February 17, 2017

```
[f,z] = routinename(funname,d,j,C,pars)
```

funname (string) :

the name of the routine that computes the matrix-valued function $A(\omega)$ and its derivative at a given ω .

d (integer) :

number of parameters, i.e., $\omega \in \mathbb{R}^d$

j (integer) :

minimize/maximize the j largest/smallest eigenvalue/singular value.

C (cell array) :

$C\{k\} = A_k$ for $k = 1, \dots, \kappa$ where A_k are matrices in the definition of $A(\omega)$.

pars (structure) :

parameters, pars.bounds.lb and pars.bounds.ub must contain the extreme corners of the box over which the optimization will be performed. For instance pars.bounds.lb = [-5 -5] and pars.bounds.ub = [5 5] means that perform optimization on $[-5, 5] \times [-5, 5]$.

For instance to compute the numerical radius of A type

```
>> pars.bounds.lb = 0
>> pars.bounds.ub = 2*pi
>> C{1} = A
>> [f,z] = leigopt_max('numrad',1,1,C,pars)
```

Here numrad is as follows.

```
function [M,Md] = numrad(z,C)

M = (C{1}*exp(i*z) + C{1}'*exp(-i*z))/2;
Md = (i*C{1}*exp(i*z) - i*C{1}'*exp(-i*z))/2;

return;
```