Subject: Re: Solving nonlinear equations
Posted by Craig Markwardt on Sat, 01 Nov 2003 23:03:47 GMT
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Thierry Savin <savin@mit.edu> writes:
> Hi all,
>
> Is it possible to create a function called let's say "solvef":
>
> IDL> x=solvef(a,'f')
>
> that returns x the solution of f(x,a)=0 ?

Either MPFIT or TNMIN from my web page can do this kind of job. Both are designed to be function minimizers. MPFIT will minimize the square of any function [in fact the sum of squares of N functions]. Although people don't normally think of it as so, MPFIT is actually an equation solver, in addition to a least squares solver.

Your set of fixed parameters, A, would normally passed using FUNCTARGS. Your notation of X (the varying parameter) and A (the fixed parameters) are actually reversed from the notation used in MPFIT or MPFITFUN, where P is the varying parameter and X are the fixed parameters. Example:

```
function fx, a, x
  return, a(0)+a(1)*x+a(2)*x^2
end


print, mpfitfun('fx', [-2d,10d,4d], [0,0,0], 10, [0d], /quiet)
    0.18614066
```

[Not sure why an uncertainty estimate of 10 is needed though, hmmm.]
Or, one can define a new function which is the square of the desired function, and use TNMIN:

```
function fffsq, x, a=a
  return, ( a(0)+a(1)*x+a(2)*x^2)^2
end

print, tnmin('fffsq', [0d], functargs={a:[-2d,10d,4d]},/autoderiv, /quiet)
    0.18614066
```

Both of these numbers are close to the exact value.

Craig

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