Subject: General fitting framework
Posted by Giorgio on Wed, 25 Feb 2009 18:03:19 GMT
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Hi,
For my research work, the data analysis is often reduced to fit data with a model. For that I often use MPfit which is a basically Levenberg-Marquardt algorithm. In general this performs well however I found that it depends a lot on the initial guess of the parameters and it often gets stuck in a local minima. There are other open source optimization algorithms written in IDL like genetic algorithms (Rob Dimeo's code) or simulated annealing (Kling's book). I am thinking in a way to implement a general fitting program that allow you to choose which algorithm to use. The best way I thought it will be by using object oriented programming. The different class objects can be:
- A class to hold the data, this can be either 2D or 1D data.
- A class to perform the function evaluations. The way that mpfit treats the function is quite general. This would have the function string and the number of parameters supported by the function. One method will be the evaluation of the function with the values positions where to do it.
- A function to evaluate the difference between the data and the model function. This is usually the chi-squared function but it can also be another one like the sum of the absolute difference. I did not know yet which if the best approach is a function or an object.
- A class for the parameters to handle the parinfo structure define in the mpfit program.
- And finally, a class to define a general framework for the optimization algorithms. Each precise algorithm will be a child of this class and will contain the algorithms parameters in it.
This is the general framework I thought about. By looking at this I realized that it will take a lot of time for me alone to do it since I will do it in my spare time. So my questions will be: Are there any suggestions or ideas of which will be a better implementation of this? And is there someone who will like to contribute or help me in doing this?

Thanks,

Giorgio