Subject: Re: Searching for fast linear interpolation routine
Posted by Wayne Landsman on Fri, 04 Apr 1997 08:00:00 GMT
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Roger J. Dejus wrote:
>
> Did someone write a fast linear interpolation routine for irregular one
> dimensional arrays (monotonically ascending or descending abscissas)
> similar in functionality to the INTERPOL.PRO routine from RSI?
>

The INTERPOL function consists of two steps: (1) finding the effective index of the interpolation value (e.g. it is located between indicies 12 and 13 in the abscissa), and (2) performing the interpolation. I know of at least 3 ways in which the speed of the INTERPOL function can be improved:

(1) INTERPOL uses a incremental search algorithm to find the effective index, whereas the quickest way to search a monotonic array is a binary search (divide and conquer).
(2) the effective index search is not vectorized
(3) the intrinsic INTERPOLATE function (available since V2.2) is not used to do the interpolation

The program LINTERP in the IDL Astronomy Library incorporates these three improvements and I get a factor of four improvement in speed on my Ultra-2.

http://idlastro.gsfc.nasa.gov/ftp/pro/math/linterp.pro

LINTERP calls the program TABINV to find the effective index

http://idlastro.gsfc.nasa.gov/ftp/pro/math/tabinv.pro

These procedures also call ISARRAY (from the JHUAPL library) and ZPARCHECK

http://idlastro.gsfc.nasa.gov/ftp/pro/jhuapl/isarray.pro
http://idlastro.gsfc.nasa.gov/ftp/pro/misc/zparcheck.pro