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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 indices 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 an 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>

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