

InterpolateTable

Basic Summary

This function takes data as a function of age and interpolates uniformly. It then compares first and third order differences to verify that they are not too large.

Inputs

There are three inputs: “age”, “data”, and “fraction”. “age” is a one-dimensional time series. “data” is the one-dimensional series corresponding to each age. The time interval of the interpolation is determined by “fraction”. If “fraction”=1 then the interpolation interval is chosen so that the number of points in the interpolated series is equal to that in the new field. The default is “fraction”=1. The quality improves with smaller values.

Outputs

There are also five outputs: “RMS error between 1st and 3rd order interpolation”, “Relative Maximum Error”, “ans” and two graphs. The first graph is the first order interpolation of the data. The second is the diagnostic between 1st and 3rd order interpolations. The RMS error between 1st and 3rd order interpolation is the relative root mean square difference between the series when estimated using linear and cubic interpolations. The 3rd order interpolation is influenced by derivatives and these can be spurious. A low value indicates good agreement, hence a reliable series. The relative maximum error is the relative change in the extreme changes; thus it should be small. “ans” stands for answer. It is the interpolated series.

Note: This function requires Degrade and Flux

Example

Input: “age”=Eage (1x5788 array of ages from EPICA ice core)
“data”=Etemp (1x5788 array of temperatures from EPICA ice core)
“fraction”=1

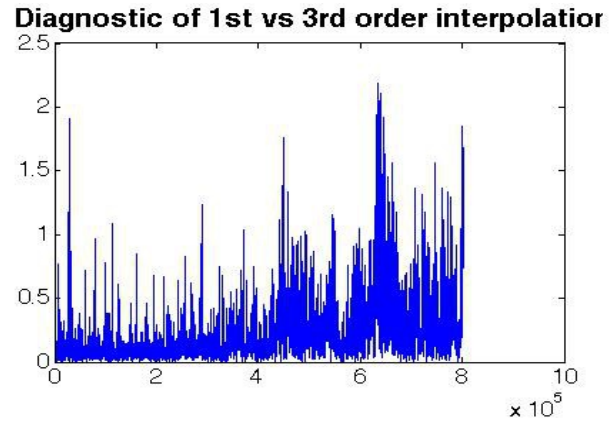
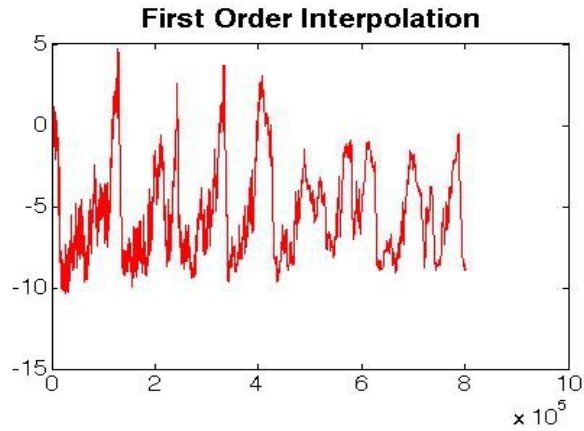
Output: RMS error between 1st and 3rd order interpolation = 0.1310;
Relative Maximum Error=-0.0441.
ans= Columns 1 through 8

0.8800 -0.2814 -1.0123 0.1404 -0.6683 -1.3839 -0.1366 -0.5587

Columns 9 through 16

-0.8243 -0.2793 -0.5823 -0.5821 -0.6736 -0.9914 -0.4143 0.2325

etc. (The output was 1x5788 so only a small part is shown here)



Errors

Error using chkxy (line 89)

The number of sites, 4, is incompatible with the number of values, 3.

Error in pchip (line 59)

`[x,y,sizey] = chkxy(x,y);`

Error in InterpolateTable (line 6)

`inter3=pchip(age,data,ai:delt:af);`

- This error occurs when “age” and “data” are not the same size. These inputs must be the same size so as each data point corresponds with an age