

Spline Fit Data Decimation for Thomeer SS

TSPACK: Tension Spline Curve Fitting Package Robert J. Renka 05/27/91 I.
INTRODUCTION The primary purpose of TSPACK is to construct a **smooth function which interpolates a discrete set of data points**. The function may be required to have either **one or two continuous derivatives**, and, in the C-2 case, several options are provided for selecting end conditions. If the accuracy of the data does not warrant interpolation, a smoothing function (which does not pass through the data points) may be constructed instead. **The fitting method is designed to avoid extraneous inflection points (associated with rapidly varying data values) and preserve local shape properties of the data** (monotonicity and convexity), or to satisfy the more general constraints of bounds on function values or first derivatives. The package also provides a parametric representation for constructing general planar curves and space curves.

Splines are usually defined as piecewise polynomials of degree n with function values and first $n-1$ derivatives that agree at the points where they join.

XlXtrFun™ Extra Functions for Microsoft Excel

One Dimensional Interpolate and Extrapolate Functions; Two Dimensional Interpolate, Extrapolate, Cubic Spline, Polynomial Curve Fitting, Minima, Maxima, First Derivative, Second Derivative, and other functions.

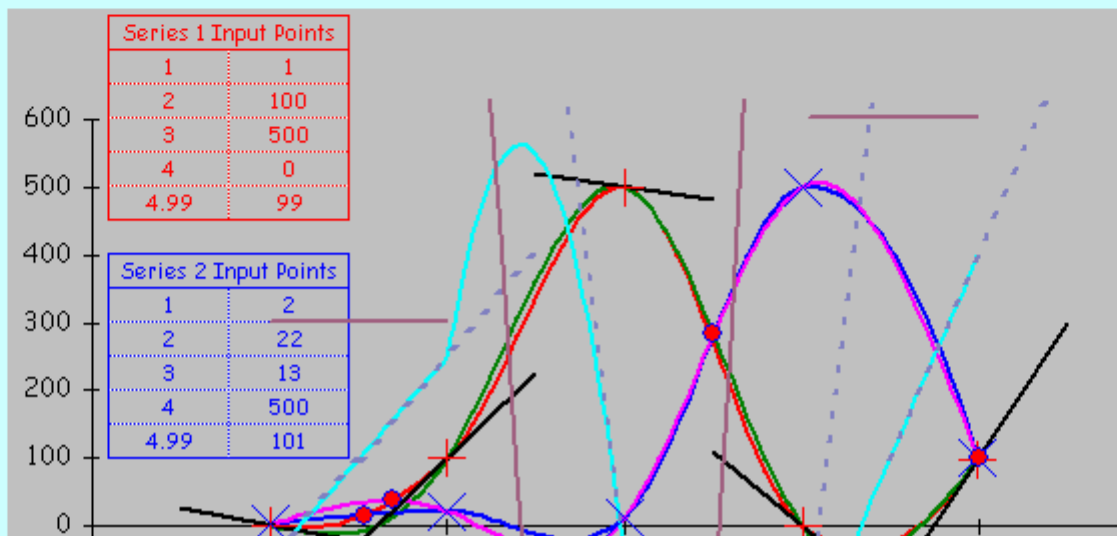
[Download now](#)

XlXtrFun.xls is a collection of functions which extends the capabilities of Microsoft Excel; developed primarily to facilitate, interpolation of 2-dimensional data, and simplify 2-variable curve fitting. XlXtrFun has been used for years by engineering and research and development personnel who need to interpolate, extrapolate, and curve fit data rapidly, reliably, and with a virtually non-existent learning curve.

If you work with real-life data and want to interpolate, extrapolate, or curve fit, then you will find these functions very useful.

"There is a great satisfaction in building good tools for other people to use."
Freeman Dyson (b. 1923); British-born U.S. physicist, author.

user in Minano, Italy: "Your functions have become very popular in the last two or three years, and it would be tough to abandon them."





Returns the 1-based index of the element in an array which is closest to a given value

2D Numerical Functions

LookupClosestValue2D

Returns the element in a 2-D array which is closest to two given values

Pfit

Returns the Y which lies on the polynomial line fit by the least squares method

PfitData

Returns the coefficients and statistics for the polynomial line fit by the least squares method

Spline

Returns the Y which lies on the cubic (or natural) spline curve at the given X

Interpolate

Returns the Y which lies on an interpolated curve at the given X

Interp

Returns the Y which lies on an interpolated curve at the given X using the defaults of Interpolate

XatY

Returns the X value at the Max. (Peak), Min (Valley), or Given Y of an interpolated curve

Intersect

Returns the X value at the intersection of two lines defined by arrays of points

ddydx

Returns the second derivative of the interpolated curve at the given X using the defaults of Interpolate

dydx

Returns the first derivative of the interpolated curve at the given X using the defaults of Interpolate

3D Numerical Functions

Interp3D

Returns an interpolated Z for known X's, known Y's, known Z's, and a given X and Y using the defaults of Interpolate

InterpMatrix

Given an X, Y, Z matrix like an efficiency hill curve matrix, interpolates or extrapolates a Z using the defaults of Interpolate

Note: 3-D Interpolation from ordered input data is part of XIXtrFun and is what the previous two functions do. **Surface Generation from Scattered Input Data** is now released and included in the zip file. Feel free to [email me](#) with any questions regarding using these routines.

Low Level I/O Functions

