

IDW Interpolator



Developed by Filip Král, May 2009.

Program interpolates measured values with the inverse distance weight (IDW) method.
IDW Interpolator won't be here without a kind guidance of Ing. Daniel Zahradník, Ph.D.

Compiled and tested on Windows XP, SP2, 32 bit, AMD Turion 64, 960 MB RAM.

Written in Lazarus IDE v0.2.96 beta.

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Loading an input file:

The input text file of measured points must have following form:

```
0;0.5;0.5001;1
1;0.3;0.22;2
3;0.4;0.33;3
4;0.9;0.11;3
```

Each column is compulsory. Column meaning is as follows:
identificator;Xcoordinate;Ycoordinate;Zcoordinate
(Z coordinate represents the measured value on the location X, Y)

Current version works fine only with positive X and Y coordinates!

Prior to loading a file, make sure that there are no points with identical X and Y coordinates in your input file.

If X and Y coordinates fall within (0, 1), use *File-Open...* (*Ctrl+O*).

If X or Y coordinates are out of the range, use *File-Open adjust...* (*Ctrl+Shift+O*). Program will automatically adjust the coordinates so the points fall within the range (0,1) x (0,1). Loading such file by *File-Open...* won't cause program failure, interpolation could be performed, but it won't be possible to display the results correctly.

Interpolation

IDW Method calculates new values according to the following formula: (parameters are marked with *):

$$\hat{z} = \frac{\sum_{i=1}^k \frac{1}{d^p} z_i}{\sum_{i=1}^k \frac{1}{d^p}}$$

\hat{z} ...estimated value
 k ...Number of points for single estimation*
 z_i ...i-th nearest point
 d ...distance to the i-th nearest point
 p ...Power parameter*

Description of single parameter influence is beyond the scope of this manual (explanation can be found easily on the internet). Default settings of *Display parameters* allow user to run the interpolation. Hence, exploration of possible settings of these parameters are up on user too. Just note that resolution of resulting raster can exceed the current display limit (250 x 250). The resulting file is interpolated correctly, it is possible to save it, but can not be displayed properly in the IDW Interpolator.

Run the interpolation by clicking on the *Run* button, which becomes active after loading an input file.

Resulting raster

After successful interpolation, the resulting raster is displayed and menu *Raster* becomes active. Use *Raster-Save to file...* to save the raster to a file (values are separated by a semicolon and stored with 12 decimal places). Menu *Raster-Calculate Statistics...* enables the user to calculate basic statistics for the raster cell values.

It is possible to display the input values over the raster surface by clicking on the *Display points over the surface* check box. Please, click several times if the the points don't display (there is a known bug). Points will be displayed on right position only if the raster resolution corresponds to one of the recommended values!