

## Rectangular Interpolation

The Rectangular Interpolation technique is most commonly applied to data that is very regularly and very closely spaced, such as points generated from another gridding application. The technique creates an interpolation surface that passes through all points without overshooting the maximum values or undershooting the minimum values. For an instructional lesson on Rectangular Interpolation refer to Lesson 3 of the *Installation and Tutorials* manual.

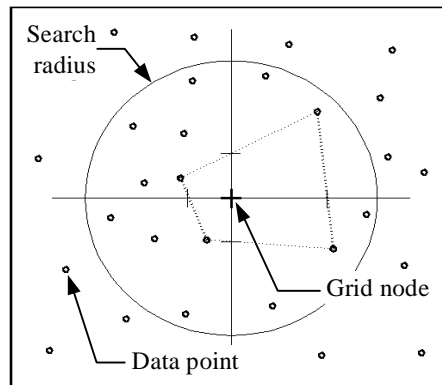
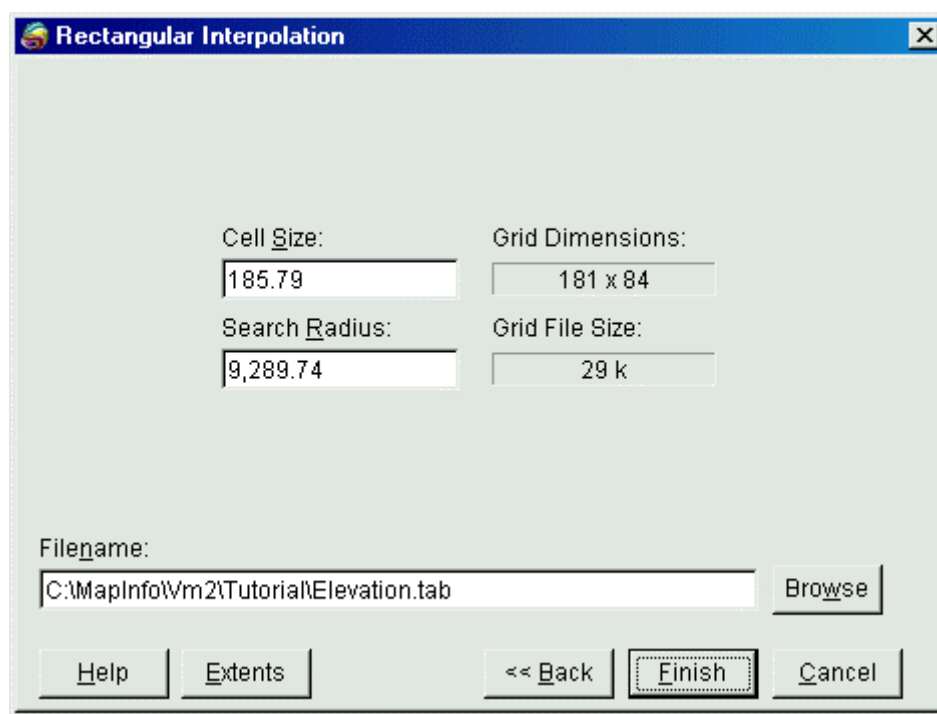


Figure 3.5 A radius is generated around each grid node from which the closest data point in each quadrant is selected to be used in the calculation

The Rectangular Interpolator locates the four nearest data points lying within a circular search zone, one from each quadrant, and connects them with a double linear “rectangular” framework (Figure 3.5). An appropriate value is calculated for each node using the slopes of connecting sides of the rectangle. However, in the absence of additional smoothing, linear artifacts are often generated across the surface when working with an irregular data point distribution. For this reason, the rectangular interpolator is most appropriate for interpolating data that is already arrayed in a closely spaced, regular grid format.

## The Rectangular Interpolation Dialogue

As discussed earlier, the Rectangular Interpolation method is initiated from the first screen of the Interpolation Wizard. After entering the appropriate table and column names in the *Select Table and Column* dialogue box, the *Next* button takes the user into the **Rectangular Interpolation** dialogue box.



- 1 The *Rectangular Interpolation* dialog box contains two parameters to be set in the gridding algorithm. Rectangular interpolation uses a bilinear method for estimating individual grid node values. At each grid node, a circular search area of a set radius is generated and divided into quadrants. Four data points from the original point file are selected, one from each quadrant, where each point is the nearest one to the node. A linear averaging solution is applied to the selected points to solve for the grid node value.
  - 1 **Cell Size** is set in real units. Note that the grid dimensions (in cell units) vary inversely with cell size: the smaller the cell, the larger the grid file. The value chosen here should be a compromise between the degree of resolution required for analysis and visualization purposes and the processing time and file size. The default value is calculated by dividing the diagonal extent of the point file by 200 (considered an optimum number based on the computing power required to solve the rectangular algorithm).
  - 2 **Search Radius** defines the maximum size, in map units, of a circular zone centred around each grid node within which point values from the original data set are selected based on the quadrant search technique described above. The default setting is calculated as a percentage of the total extent of the map area and is appropriate for most data sets.

- 1 The ***Extents*** button opens an information box that summarizes the geographic size and the Z-value range of the original point data base, the density of the points, as well as the data value units.
- The user may either select the ***Finish*** button to complete the gridding process or, if modifications to the previous dialogue are required, select the <<***Back*** button to return to one or more dialogues back. Once the gid file is created, it appears in a MapInfo Map window with a default colour palette applied. The user may change the colour range assigned to the grid file using commands discussed in Chapter 7.