

Filling Gaps in Sparse Matrices

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If you design your matrix with a cell size that is very small, your survey can end up with a sparsely populated matrix. You can post-process your data using the TIN MODEL program to fill in the matrix, but this is an additional step that can not be done online.

The SURVEY program now allows you do it automatically. You can choose between two operations.

• Interpolate while you are logging data.

In such case, you open the Matrix Option dialog and select the appropriate "Interpolation Span" which will limit the interpolation distance. Once this is done, you just have to start logging and the program will interpolate the data to fill unpopulated cells with no additional intervention.

FIGURE 1.	Interpolating	Matrix Depths	On Line
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Matrix Options	C
Record Depth Minimum 💌 OK	
Matrix update While logging 💌 Cancel	
✓ Use Depth filter Save only strikes in XYZ file Min 0.00 Max 0.00 Use uncorrected depth	
Gap Interpolation Span	

• Fill gaps in offline mode.

In order to fill the gaps offline:

- 1. **Disable the Gap Interpolation Span** in the Matrix Options dialog, then log your data.
- 2. When you stop logging, select the desirable GAP Interpolation Span.
- 3. Select MATRIX-FILL GAPS.

FIGURE 2. Filling Matrix Gaps Off Line



You can experiment with different Gap Interpolation Span values until you get a satisfactory result.

Interpolated cells do not interfere with the original data.

Additionally, interpolated cells are not saved in the file. The only way to export interpolated cells is to save the data in XYZ format.

How it works

The interpolation algorithm will be explained in the following example with 2-cell span. Let us assume that green and gray cells are populated with real depth (3 and 6 respectively).

							-
1	1	1	1	1			
1	2	2	2	1			
1	2		21	1 1	1	1	1
1	2	2	21	12	2	2	1
1	1	1	11	12		2	1
			1	2	2	2	1
			1	1	1	1	1

FIGURE 3. Exa	ample of Inter	polation Acro	oss 2 Cells
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3	3	3	3	3			
3	3	3	3	3			
3	3	3	4	4.5	6	6	6
3	3	3	4	5	6	6	6
3	3	3	4.5	5	6	6	6
			6	6	6	6	6
			6	6	6	6	6

We create 2-cell neighborhood for each cell and associate weight to each cell. The inner circle gets the weight of 2 while outer circle get the weight of 1.

Final depth = (depth1*weight1 + depth2*weight2)/(weight1 + weight2)

(EQ 1)









FIGURE 6. Survey Data Displayed in the New 3D Matrix Window

