Histofit© Version 1.0 (all right reserved)

User guide

1. Click on the button **Clear data** to clean the excel data sheet from all input data

2. Click on the button **Goto sheet data** to fill the column **Slope angle value** and the column **Data**

- **Slope angle value**: Classification of the slope angle distribution in bins of size chosen by the user. Usually, a bin size of 1° is used, so that the column **Slope angle value = [1; 90].**
- **Data**: Sum total area of the topography for each slope angle value defined previously (planimetric area).
- **Frequency**: The column **Frequency** normalises the column **Data** according to the total area of the considered topography (**Data Sum**)
- **Planimetric correction**: Effective surface area for each slope angle bin. The sum total area per unit slope angle (planimetric area) is corrected according to its steepness due to the fact that the surface area of a DEM is underestimated in comparison with its effective surface area.
- **Frequency Sum** Check box to ensure that the normalisation was operated correctly. This muss be equal to 1!

3. Click on the button **Go back to histofit** to reenter the histofit Excell cell sheet.

4. **check if used [1] = 1.** Chose the number of Gaussian curves you want to add in order that the sum of the Gaussian curve reconstructs the slope angle frequency distribution. This is done by setting above each column Histo 1, Histo 2, etc. a flag 1 or 0 in the line check if used [1]. There is a maximum of 5 Gaussian curves to be added in histofit.

   check if used [1] = 0 In order to disable a Gaussian curve to be added. To avoid the solver to crash, this is advised not to leave any Histo 1, Histo 2, etc. column free. If you want to use 3 Gaussian curves only, it's better to fill the 3 first columns.

5. Initial parameters are typed beside the following lines for each Gaussian curve (Histo 1, Histo 2, etc.) column with a check if used [1] set to 1.

weight	weighting factor influencing the height of the mode
mean	mean value of each Gaussian curve
std dev.	standard deviation of each Gaussian curve

6. Click the button **Run** to perform the best reproduction of the sum of the Gaussian curves with the slope angle distribution. When the solver finds a solution, a pop-up window appears:

Select **keep the solution + ok**	validate the minimization
Select **restore the original value**	invalidate the minimizaion and restore the initial input values

The excell Solver contains a few option:

- Click Answer, Sensitivity or Limits and ok to create a report with a predefined label.
- Save your scenario by clicking save Scenario and entering a Scenario name. Such scenari can be reloaded later under the Scenario Manager (click on the toolbar: **Tools --> Scenarios**).

7. The column **Sum** indicates the value of the sum of the Gaussian curves (the slope angle distribution reconstruction curve) for each bin. The column **Squared diff.** indicates the difference between the slope angle distribution and the sum of the Gaussian curve. The cell Distance gives the sum of the **squared diff.** values and the cell **R square** computes the coefficient of determination of the reconstructed curves according to the slope angle distribution.

8. Click on **Data display** to view the results as an excel chart. Title, comments, font and so on can be added or modified as a normal excel chart.

A practical example of the application of histofit© can be found under Loye, A., Jaboyedoff, M., and Pedrazzini, A.: Identification of potential rockfall source areas at a regional scale using a DEM-based geomorphometric analysis, Nat. Hazards Earth Syst. Sci., 9, 1643-1653, 2009. (http://www.nat-hazards-earth-syst-sci.net/9/1643/2009/nhess-9-1643-2009.html).

More information can be found under www.unil.ch/igar