



WEBINAR

Using ShapeMetriX and Dips for Geological and Geotechnical Assessments

Q1: In which formats can JMX Analyst currently export the resulting 3D model with all structures?

A1: The JMX Analyst can currently export 3D models in the following formats: DXF, OBJ, VRML, CSV. Map: DXF, VRML, CSV, and 3GDPS (dips)

Q2: To date, there are several similar 3D geological mapping software options that include automated AI features to define structures within the model. Are there any plans to develop ShapeMetrix in that direction?

A2: Yes, although with a slightly adapted approach compared to generic AI analysis.

Q3: What data file formats will the software accept for importing topography and images?

A3: JPG for 3D model generation and OBJ and E57 in the next major update.

Q4: Will the traces that the user lays out also provide discontinuity spacing?

A4: Yes, this can be done.

Q5: Can borehole data be added to the software to add to the orientation data?

A5: Unfortunately, this functionality is not available yet.

Q6: Is the software providing the true spacing for each joint set?

A6: Yes, this can be done.

Q7: By digitizing a joint and specifying its dip/dip direction, is it possible to have other joints with the same features (dip/dip direction) instead of digitizing each one individually?

A7: No, this is currently not possible.

Q8: Is there an option to round the degrees to no decimal? That is seeing a dip/dip direction with standard deviation?

A8: No, this is currently not possible.

Q9: Is there a way to identify all the planes of the rock mass using ShapeMetrix?

A9: We do not have this functionality at the moment.

Q10: Does it work with colorized scans that match the pictures from Hovermap scans underground?

A10: If this means a coloured point cloud, yes it can be done.

Q11: Can ShapeMetriX generate cross sections?

A11: Yes, ShapeMetriX can generate cross sections.

Q12: Can we project circular or concentric joints using this software?

A12: No, this is currently not possible.

Q13: How precise is this software compared to field observations?

A13: There were several attempts to compare field measurements and measurement from 3D model. One important outcome was, that field measurements of different people show more variations than different measurements from 3D models. Another result with ground truth showed typical deviations in the range of 0,5 - 1,0°

Q14: "Can we analyze multiple factors for instability in the Dips software?"

A14: Kinematic analysis is a preliminary analysis that allows users to easily and quickly check for various rock slope stability failure modes on a stereonet plot by simply inputting the slope orientation, friction angle and lateral limits. (Continued on next page).

The objective of kinematic analysis is to identify potentially unstable blocks and possible modes of slope failure (planar or wedge sliding, block or flexural topping) which satisfy the frictional and kinematic conditions, however kinematic analysis does not give Factor of Safety (FoS) result. Users can obtain the summary of critical count and/or percentage of planes or intersections for each kinematic failure mode. Multiple kinematic failure checks for different failure modes can be done separately.

Q15: Regarding ShapeMetriX for underground scenarios, is there a function to adjust the orientation of the model, taking into account the potential unreliability of photo orientation?

A15: Not sure what potential unreliability of photo orientation means, All photos that are used for 3D model generation are composed in a common arrangement, so a single photo cannot be misoriented in this arrangement per se. However, the resulting model can be brought into a superior co-ordinate system including rotating it.

Q16: Will XYZ coordinate positions be exported from ShapeMetriX for the purpose of using the output data in Rocscience's RocSlope3?

A16: Yes, you can export the XYZ coordinates from ShapeMetriX.

Q17: Can ShapeMetriX be used for underground applications?

A17: Yes, this can be done.

Q18: Is a special drone required for ShapeMetriX?

A18: All commercially available drones are compatible with ShapeMetriX.

Q19: What are the differences between the stereonet analysis in Dips and in ShapeMetriX? What is the best way to utilize both software?

A19: **ShapeMetriX**: provides a view to the discontinuity sets in conjunction with a detailed photorealistic 3D model; the discontinuity sets also provide statistical information on their spatial variation (spread); there are no geomechanical analyses made here.

Dips: the stereonet analysis in Dips also provides the ability to perform a comprehensive statistical analysis on joint sets, however, the prominent features of the stereonet analysis in Dips are the Kinematic Analysis and Kinematic Sensitivity Analysis. With the kinematic analysis of planar sliding, wedge sliding, or direct and flexural toppling failure modes; critical zones, vectors and intersections can be identified on a stereonet overlay. By performing a kinematic sensitivity analysis, the effects of varying kinematic properties (slope dip, slope dip direction, friction angle, lateral limits) on the number of kinematically critical vectors and intersections can be obtained and visualized.

Q20: Can we obtain additional information for rock mass characterization besides joint orientations? Can this data be used in other Rocscience applications?

A20: Number of joint sets, joint positions, (visible) joint size, profiles for quantifying joint roughness, if visible - aperture, water ingress, rock types by colour.