

# Orientation Data Workshop

F.W. Vollmer, 2022 SG&T Forum

Saturday Morning, June 25

The orientations of lines and planes are fundamental data that underpin geologic maps, and structural and tectonic interpretations. While these are commonly presented on equal-area (Schmidt) plots, there is often little additional evaluation. Their presentation should normally include a scatter plot, a measure of the mean, a measure of variability, and a depiction of the estimated density distribution. More complex analysis is required for line-in-plane data, and data that includes multiple modes.

This half day workshop will explore some of the tools available in the free Orient fabric analysis software using example data sets. Topics covered will include:

Geologic fabric analysis:

- Overview of data entry, graphics, spreadsheet import, StraboSpot import.
- Spherical projections, properties, and contouring methods.
- Confidence cones, spherical distributions, and bootstrap statistics.
- Orientation tensors and their interpretation, PGR plots.
- Kinematic analysis and fault slickenside inversion.
- Cluster analysis and evaluation of data sample modes.

Optional topics may include:

- Moment triangle plots for focal mechanisms and kinematic data.
- Spherical coordinates, and projection, net, and data rotations.
- Google Map and Google Earth display, UTM conversion.
- Circular histograms, means, and kernel density estimates.
- Small circles, and circular and elliptical conical data.
- Eigenvector structural domain and map analysis.
- Orthonormal frames and rotation plots.

The workshop will be informal, allowing discussion, questions, and hands-on analysis. Participants must come prepared with their own laptop (Windows, Macintosh, or Linux), with the current version of Orient already installed:

<https://vollmerf.github.io/orient/>

<https://www.frederickvollmer.com/orient/index.html>

This workshop was previously given at the 2016 SG&T Forum at Sonoma State University. Extensive changes in the software have been implemented since then. Orient has been in continuous development since 1986.

