



Hands-on guide for 3D image creation for geological purposes

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Geological structures in outcrops or hand specimens are inherently three dimensional (3D), and therefore better understandable if viewed in 3D. While 3D models can easily be created, manipulated, and looked at from all sides on the computer screen (e.g., using photogrammetry or laser scanning data), 3D visualizations for publications or conference posters are much more challenging as they have to live in a 2D-world (i.e. on a sheet of paper). Perspective 2D visualizations of 3D models do not fully transmit the “feeling and depth of the third dimension” to the audience; but this feeling is desirable for a better examination and understanding in 3D of the structure under consideration.

One of the very few possibilities to generate real 3D images, which work on a 2D display, is by using so-called stereoscopic images. Stereoscopic images are two images of the same object recorded from two slightly offset viewpoints. Special glasses and techniques have to be used to make sure that one image is seen only by one eye, and the other image is seen by the other eye, which together lead to the “3D effect”. Geoscientists are often familiar with such 3D images. For example, geomorphologists traditionally view stereographic orthophotos by employing a mirror-stereoscope. Nowadays, petroleum-geoscientists examine high-resolution 3D seismic data sets in special 3D visualization rooms.

One of the methods for generating and viewing a stereoscopic image, which does not require a high-tech viewing device, is to create a so-called anaglyph. The principle is to overlay two images saturated in red and cyan, respectively. The two images are then viewed through red-cyan-stereoscopic glasses. This method is simple and cost-effective, but has some drawbacks in preserving colors accurately. A similar method is used in 3D movies, where polarized light or shuttering techniques are used to separate the left from the right image, which allows preserving the original colors. The advantage of red-cyan anaglyphs is their simplicity and the possibility to print them on normal paper or project them using a conventional projector.

Producing 3D stereoscopic images is much easier than commonly thought. Our hands-on poster provides an easy-to-use guide for producing 3D stereoscopic images. Few simple rules-of-thumb are presented that define how photographs of any scene or object have to be shot to produce good-looking 3D images. We use the free software Stereophotomaker (<http://stereo.jpn.org/eng/stphmkr>) to produce anaglyphs and provide red-cyan 3D glasses for viewing them. Our hands-on poster is easy to adapt and helps any geologist to present his/her field or hand specimen photographs in a much more fashionable 3D way for future publications or conference posters.