

Digital Terrain Representation Methods and Red Relief Image Map, A New Visualization Approach

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We propose **Red Relief Image map**, a new three dimensional presentation technique for digital elevation model.

This image is created by three landform elements, slope, positive openness, and negative openness. Positive and negative openness are devised by Yokoyama et.al. (1999). These images are created by large image-processing filter that parameterize condition with surrounding terrain features. Difference between inverted negative openness image and positive openness correspond to extent of ridge and valley, and this image represent multi scale terrain visualization in three dimensions(Chiba and Suzuki,2004).

Furthermore, overlaying red colored slope gradient on openness image, visual effect of three dimensions are enhanced. **Red Relief Image Map** overcomes some shortcoming of existence technique, like shaded relief has a problem of dependency to sun direction by shaded relief, or a limitation of representing micro-landform by contour map. This image is impressive and enables comprehensive cognition of terrain attributes.

We illustrate some application examples of red relief image map and fusion with the other technique over various scale and area.