Abstract

Lineament extraction from satellite data has been the most widely used applications in geology. Recent developments in digital image processing have made the extraction of lineament in semi-automatic to fully automatic approaches possible. In this study, a fully automatic approach, consisting of a combination of edge-line detection Canny algorithm was used, a grid operator designed for the analysis of potential field data was applied to a digital elevation model for the detection of lineaments using Landsat TM and ASTERGDEM images. At different orientations, by simulating topographic illumination under varied light directions, lineaments can be enhanced and mapped. The lineaments extracted show almost a similar orientation and differences in density. Combinations of four shaded relief images within the four sun azimuth directions of light sources at 0°, 45°, 90° and 135° give N-S, NE-SW, E-W and NW-SE directional trends. The results obtained have been evaluated using both an existing lineament map of the area and a field investigation. The high degree of consistency between the suggested method and the existing tectonic map indicates that lineaments in the study area are largely topographic. Field validation confirmed these findings except in a few well defined situations.
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Index Terms

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  Lineaments  LandsatTM  ASTERGDEM  Remote Sensing  Schistbelt