

## Fuzzy B-spline algorithm for 3-D lineament reconstruction

### Abstract:

Lineaments are vital geological features that play the role of a key indicator for ground water and petroleum searching. At present, there is no study that has utilised remote sensing satellite data to reconstruct three dimensional (3-D) lineament visualization in the United Arab Emirates (UAE). This work aimed at reconstructing a (3-D) lineament visualization from multispectral remote sensing such as LANDSAT TM. In doing so, the fuzzy B-spline algorithm was used to reconstruct 3-D from two dimensional (2-D) LANDSAT TM 7 satellite data. Prior to the fuzzy B-spline algorithm, image enhancement contrast, stretching and linear enhancements were applied to acquire an excellent visualization. In addition, automatic detection algorithm of Canny was performed to extract linear features in multispectral remote sensing data, that is, lineaments, fractures. Uncertainty digital elevation model (DEM) was performed by using fuzzy B-spline algorithm to map spatial lineament variation in 3-D. Further, a fuzzy B-spline algorithm was used to reconstruct 3-D visualization of lineament with standard error of mean of 0.12 and bias of 0.23. In conclusion, fuzzy B-spline provides excellent promising for 3-D geological features reconstruction from two dimensional (2-D) remote sensing satellite data.