DEDUCING TOPOGRPHY USING IRREGULARLY SPACED, FINITE ELEVATION DATA, FOR JAFFNA PENINSULA

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Topography plays an important role in Geosciences and Engineering. Deducing rightful topography is highly important in many of the scientific applications. Though it is the case, the data related to topography is extremely difficult to collect and update when changes are taking place. Thus it is important to see how mathematical models could be used to correctly derive topography by using irregularly distributed finite samples of elevation data. This study focused on using polynomial curve fitting in its first and second order respectively for the Jaffna peninsula area of Sri Lanka. Twelve control points with MSL heights were used to fit the first and second order polynomials. Each and every point of sample data has been applied to calculate pair of distance and height variations. The divergence of model has been calculated by using Least Squares technique (LST). The general topography shows the elevation dropping from south east to North West. Further the model was tested for fitness by using one-leave-out method. The first order polynomial was estimated with a minimum mean error of 0.0096 m and in the second order polynomial it was –0.5546 m. First order coefficients were determined, from the average value by one-leave-out method. Prepared model parallelized with Shuttle Radar Topography Mission (SRTM) 30 meter spatial resolution DEM. The results suggest that the first order polynomial is having the best fit with Ground truth data while the smoothness of polynomial depends on height variations.

Keywords: *Topography, Control points, Polynomial, Proportion, LST*