
Linear Feature Modeling with Curve Fitting: Parametric Polynomial Techniques

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Abstract

A decomposition model is described to model linear features sampled by manual digitization or field survey. The model consists of three components, original data, systematic pattern, and random error. Least squares and moving least squares techniques are introduced for polynomial curve fitting. Polynomial functions are proposed to represent linear features. The position deviation between sampled points and the polynomial function is used as an approximation of the random error. Experimental results are presented to show the effectiveness of the decomposition model. Potential applications of the model have been discussed including estimation of errors associated with points sampled along linear features, digital representation and mapping of linear features.
