

Fuzzy Intuitionistic Alpha-cut Interpolation Rational Bézier Curve Modeling for Shoreline Island Data

ABSTRACT

The problem of uncertain data cannot be solved by conventional methods, which results in inaccurate data analysis and prediction. During the data collecting phase, ambiguous data are often collected, but they cannot be used immediately to generate geometric models. In this case, the new approaches to intuitionistic fuzzy sets will be used to determine the alpha cut value for uncertainty data sets. To solve the uncertainty data and build the mathematical model, this study applied fuzzy set theory, intuitionistic fuzzy sets, and rational Bézier curve geometric modelling. There are three main methods in this study. The triangular fuzzy number is used to define the uncertainty data in the first place. The alpha value can then be found using a centre of mass alphacut. The intuitionistic alpha-cut can then be applied to both membership and non-membership data. This procedure, also called fuzzification, is defined as fuzzy intuitionistic into alpha-cut values. The data set will then undergo the defuzzification procedure to get single value data. For the purpose of analysis and conclusion-making, the modeling data for each process will be visualised using an interpolation rational Bézier curve. The findings demonstrate that using the intuitionistic fuzzy set for the alpha-cut value was more effective than the previous method without considering both membership and non-membership values.