



Marmara University
Arts and Sciences Faculty
Department of Statistics



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**“A Fuzzy Nonlinear Regression Model: L_2 -Norm Estimation
with Genetic Algorithm by using Type-2 Fuzzy Numbers”**

One of the acceptable reason for application of fuzzy regression analysis is that the uncertainty of the limited data. Many mathematical models, represent the relationships among the response and input variables, contain parameters that are not expressed linearly in the modeling form of these small sized data sets. In this case, fuzzy nonlinear regression analysis is preferred to use. The goal of the fuzzy nonlinear regression analysis is to obtain the parameter estimates that minimize the total difference between the predicted and observed fuzzy response values. In this study, L_2 -norm based principle, known as the least squares, is used to obtain fuzzy nonlinear regression model parameter estimates. The unknown model parameters and response variable are considered as Type -2 fuzzy numbers which are able to handle more uncertainty. Here, the input variables are considered as crisp. Genetic Algorithm (GA), a well-known population based metaheuristic algorithm, is used to minimize the sum of squared fuzzy deviations. An illustrative example is provided to demonstrate the application of proposed fuzzy parameter estimation approach.

**Department of
Statistics**

Ankara University

Research Areas

Numerical Analysis
Fuzzy Modeling
Response Surface Methodology
Computational Statistics
Multi-objective Optimization
Heuristic Algorithms

Venue

Marmara University,
Göztepe Campus,
Institute Building
Conference Hall

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