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Comparing Accuracy of Surface Fitting between Artificial Neural Network and Interpolation With Cubic Splines

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Abstract

This paper seeks to simulate a real-life problem of fitting a surface from observed data with random errors. We will seek to determine which of two methods, Artificial Intelligence with an Artificial Neural Network or interpolation with cubic splines, will produce the most accurate fitting of the surface we have chosen for the simulation. The measure of accuracy used will be the mean integrated squared error. In order to examine which method is more appropriate to use under different circumstances we will also vary the learning time for the Artificial Neural Network as well as the standard deviation of the random errors in the data. This goal will be achieved by determining which method has the lowest mean integrated squared error for different combinations of error standard deviation and learning time for the Artificial Neural Network.

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