AN AUTOCORRELATION TERM METHOD
FOR CURVE FITTING

Louis M. Houston

Abstract

The least-squares method is the most popular method for fitting a polynomial curve to data. It is based on minimizing the total squared error between a polynomial model and the data. In this paper, we develop a different approach that exploits the autocorrelation function. In particular, we use the non-zero lag autocorrelation terms to produce a system of quadratic equations that can be solved together with a linear equation derived from summing the data. There are a maximum of $2M$ solutions when the polynomial is of degree M. For the linear case, there are generally two solutions. Each solution is consistent with a total error of zero. Either visual examination or measurement of the total squared error is required to determine which solution fits the data. A comparison between the comparable autocorrelation term solution and linear-least squares shows negligible difference.