A Characterization Theorem for the Discrete Best L_1 Monotonic Approximation Problem

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Abstract

Let n measurements of a real valued function of one variable be given. If the function is monotonic but the data have lost monotonicity due to measuring errors, then the least sum of the moduli of the errors that provides nonnegative first divided differences may be required. A characterization theorem is obtained for the solution of this problem in terms of Lagrange multipliers.

Key words: first divided differences, monotonic approximation, L_1-norm.