Bayraktar, B.; Kudaev, V.
About an algorithm of function approximation by the linear splines. (English) Zbl 1368.65024

Summary: The actual application for the problem of best approximation of grid function by linear splines is formulated. A mathematical model and a method for its solution are developed. Complexity of the problem is that it was multi-extremal and could not be solved analytically. The method is developed in order to solve the problem of dynamic programming scheme, which is extended by us. Given the application of the method to the problem of flow control in the pressure-regulating systems, the pipeline network for transport of substances (pipelines of water, oil, gas, and etc.) that minimizes the amount of substance reservoirs and reduces the discharge of substance from the system. The method and the algorithm developed here may be used in computational mathematics, optimal control and regulation system, and regressive analysis.

MSC:
65D15 Algorithms for approximation of functions
65D07 Numerical computation using splines
41A50 Best approximation, Chebyshev systems
49L20 Dynamic programming in optimal control and differential games

Keywords:
grid functions; best approximation; minimal deviation; linear splines; dynamic programming; optimal regulation; numerical examples