Multifacility Location Problem using Scaled Conjugate Gradient Algorithm under Triangular Area Constraints

Abstract

The problem of finding the multiple locations for new facilities with respect to the multiple existing facilities in a given environment is known as Multifacility Location Problem (MLP). Every location problem is normally bounded by some sort of area constraint. But the fact that much of the work carried out in the literature has almost neglected the area constraint which has motivated us to work on Multifacility Location Problem taking the area constraint into consideration. The mathematical model of the multifacility location problem with area constraint has been developed and the solution has been obtained using Kuhn-Tucker theory. This mathematical analysis and solution procedure is highly complex and time consuming. Hence, an attempt has been made to get the solution of a complex, constrained multifacility location problem using Scaled Conjugate Gradient Algorithm (SCGA) in Artificial Neural Networks (ANN). With the help of Numerical examples, it has been established that the solution obtained through ANN model compares well within the acceptable limits with those obtained through analytical method.

Reference

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Index Terms

Computer Science Neural Networks

Key words

Multifacility Location Problem Area Constraint

Kuhn-Tucker theory

Artificial Neural Networks (ANN)

Scaled Conjugate Gradient Algorithm (SCGA)