

Chayanee Lausuksuwan 2010: A Decomposition Algorithm for Rectilinear Distance Multi-facility Weber Problems. Master of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Ms. Chansiri Singhtaun, D.Eng. 96 pages.

This thesis proposes heuristic methods for capacitated multi-facility location problems. The problem is to select the optimal locations of m facilities on continuous plane and the allocations of n customers demanding for a certain amount of inseparable products to each facility with respect to its capacity limitation so as to minimize the total transportation rectilinear distance between facilities and customers. There are two heuristic algorithms developed under decomposition approach, which are the decomposition algorithm with random initial locations and the decomposition algorithm with specified initial locations at locations of customer requiring maximum products. Under this approach, a complex problem will be decomposed into two small sub-problems, location and allocation problem. They will be alternately solved. The solution of each sub-problem is used to improve the solutions of the other. The iterative process continues until the solution can not be improved. Both algorithms are first compared with the direct algorithm to preliminary define their efficiency. Finally, both algorithms are compared with the exact algorithm with premature termination. The result shows that the decomposition algorithm with specified initial locations gives better solutions with smaller computational time than the decomposition algorithm with random initial locations. Also, it gives the solution error between - 12.83 and -1.77 % with 95% confidence when comparing with the solutions from exact algorithm with premature termination.

Student's signature

Thesis Advisor's signature

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