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A Multi Objective Reliable Location-Inventory Capacitated Disruption Facility Problem with Penalty Cost Solve with Efficient Meta Historic Algorithms

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Abstract : Logistics network is expected that opened facilities work continuously for a long time horizon without any failure; but in real world problems, facilities may face disruptions. This paper studies a reliable joint inventory location problem to optimize cost of facility locations, customers' assignment, and inventory management decisions when facilities face failure risks and doesn't work. In our model we assume when a facility is out of work, its customers may be reassigned to other operational facilities otherwise they must endure high penalty costs associated with losing service. For defining the model closer to real world problems, the model is proposed based on p-median problem and the facilities are considered to have limited capacities. We define a new binary variable (Z_is) for showing that customers are not assigned to any facilities. Our problem involve a bi-objective model; the first one minimizes the sum of facility construction costs and expected inventory holding costs, the second one function that mention for the first one is minimizes maximum expected customer costs under normal and failure scenarios. For solving this model we use NSGAII and MOSS algorithms have been applied to find the pareto- archive solution. Also Response Surface Methodology (RSM) is applied for optimizing the NSGAII Algorithm Parameters. We compare performance of two algorithms with three metrics and the results show NSGAII is more suitable for our model.

Keywords : joint inventory-location problem, facility location, NSGAII, MOSS
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