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Performance Analysis of Memetic algorithm Using VIKOR Method

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Abstract

A memetic algorithm is a variant of the traditional genetic algorithm is expansion. This is a local search technique Uses, which are pre-merged Reduces chance. A simplified data Cryptographic analysis of an encryption standard is NP-hard Can be formulated as a joint problem. Memetic algorithms (MAs) are global search Evolution uses local search rather than algorithms are the means. MAs are evolutionary mechanisms are, they are local search to refine individuals using processes. Dolphins, Elegans, Hamsterster, Ca-Grqc. The size of population, the number of generations, Size of the mating pool, Tournament size, the probability of crossover, the probability of mutation. From the end based on the number of generations are the result seen and got the first Rank, whereas the probability of mutation got having the lowest rank. The Value of dataset for Memetic Algorithm in VIKOR method shows that it results in the number of generations and top ranking.

Keywords: Memetic Algorithm, Logistics Network Algorithms, Evolutionary Strategy, MCDM method.

I. Introduction

Memetic algorithms (MAs) are global search Evolution uses local search rather than algorithms are the means. MAs are evolutionary mechanisms are, they are local search to refine individuals using processes. Universal and When we combine local search, it is global Optimization becomes a process. Good alternatives are differential evolution, evolutionary strategy, and evolutionary programming. An appropriate design of a GA requires that the algorithm provide an efficient solution to larger problems than conventional integer programming approaches. From the book The Selfish Gene by Richard Dawkins Received, memes are culturally transmitted between individuals denote units of expression; This communication Examines how it affects practices. VIKOR is an integrated fuzzy qualifier Based on this; it is an alternative to the best solution represents the distance. Fuzzy Functions and Fuzzy Procedures for ranking numbers are ambiguous are used in developing the VIKOR algorithm. Vigor method uses an aggregation function Q that represents “closeness to ideal”. The TOPSIS method falls far short of The optimal solution is far from the negative-optimal solution Determines that distance is farthest solution.

II. Memetic Algorithm

Our approach is to maintain the fitness allocation methods used in PAES, combine population and crossover to develop a Pareto-based method and For multi-objective optimization Memetic Algorithm. [1] MACOL, Map Colorization A memetic algorithm for the problem. The proposed algorithm combines several original features. First [2] Memetic algorithms known as hybrid Much to the success of search and optimization For critical exploration and exploitation processes To maintain a balance between EAs and local search (LS) heuristics can be implemented. [3] Constructive heuristics, optimization heuristics and their hybrids. Constructive heuristics are new, mainly two and three engine planning Solves problems. [4] We describe a memetic algorithm (MA) MAs are population-based met heuristics Search methods are Darwinian natural selection Inspired by the principle and Dawkins monument, itself when people exchange ideas As a reproducible unit of information is defined. [5] Moscow defined the Norman Memetic Algorithm, Integrated local search in GAs to optimize. MAs, case demonstrating practical success- Demographic horticulture search for specific local searches deals with approaches, and for approximate solutions A classification of various problem domains called MAGS and oversees genetic selection. [6]. Memedi+ to increase the efficiency of the logistics network Algorithms with Non-Memetic Algorithms Compared to The most powerful of memetic algorithms Versions are process-intensive genealogical shortcut and each initial Obtained by mutation also applied to the solution. Some classical optimization for problems, memetic algorithms are currently the best are the solution [7]. Diameter decision variables, as well as pipe structure, connection Requirements are imposed. Simulated annealing there are other meta-heuristic approaches including SA and MSATS are local search-based methods. The only solution is in the search function [8]. Application does not limit the application of these procedures to other problem domains. Reorientation operators or local search engines can be used for other problems amenable to permutation-based representations, such as scheduling problems.[9] MAGS is embedded for attribute selection Based on approach, this Closer to the classification selection process related to The strength of MAGS is that it is a specific crossover operator and a dedicated local search procedure Relying on synergy created by combining, these Both are guided by SVM related information. [10] Particle Swarm Optimization Algorithm and Pattern Search By combining, a to optimize the parameters of SVMs An Efficient BSOPS-Based Memetic Algorithm proposed. [11] Memetic algorithms are a classical genetic Evolution uses local search within the algorithm Belongs

to the class of mechanisms. Search a framework for intensification. Many such [12] In Ontology by Memetic Algorithm (MA). The process of improving alignments, a measure that complements the Match Measurer. [13] A proposed memetic algorithm to solve MC-VRP Introducing. A memetic algorithm is a hybrid Genetic algorithm, which optimizes the search A local search process is used. [14] In a population-based approach Structured Memetic Algorithms (MAs) and Search Equilibrium analysis using space is research have attracted attention and recently used to solve VRPTW. [15] Memetic algorithm and surrogate-assisted memetic A standard genetic algorithm is a rather than that converges more effectively to good solution quality Showing the most commonly used benchmark problems Empirical results are presented for continuation. [16] A memetic based on mixed integer programming the algorithm is implemented, which is layered thin-film So much for practical broadband optimization of materials appropriate. [17] We abbreviate the Algorithm as MLCD. MLCD is a genetic algorithm Accepts and unites as a universal quest Multi-level learning proposed to accelerate It uses an algorithm. [18] The genetic algorithm applied to the entire test set is used at regular intervals to the memetic algorithm, which examines search primitive variables and tries to use local search to optimize them. [19] A memetic algorithm like mutation and crossover multiple configurations thanks to variation operators create. It also includes a local search operator. [20] During MA-TOSCA optimization procedure, communication costs the total number of connections to reduce remains unchanged. [21] A New Memetic Algorithm (MA) Extended Neighbor Search with Decomposition-Based MA. A new algorithm is single-objective CARP and advanced features from both Integrates the multi-objective MAENS approach to evolutionary optimization. [22] A memetic algorithm is a global and local search A hybrid evolutionary method that combines search and to solve the job shop scheduling problem an improved memetic algorithm [23]. To improve Integration efficiency of algorithms, proposed Algorithms of local search with different neighbors basically improve memetic algorithms. Systems connected with additional features extracted from the urban transportation network. [24] Integration efficiency of algorithms, proposed A case study was conducted and the memetic algorithm and a comparison between genetic algorithms done [25]

III. VIKOR

As usual in most MCDM techniques, VIKOR method is subjective in a fuzzy environment and expanded to accommodate imprecise data various fields.[6] Based on Hamming distance, PHESP sites A VIKOR method is proposed to sort. Various As per the type of decision making information need To be translated, the values of the variables are the same This method is in units very useful for unspecified problems will be. [7] The VIKOR method is a "closer" to the best solution A ranking index based on a specified metric Introducing. On the contrary, the basis of TOPSIS method The principle is that the chosen alternative is optimal "Short-distance" and "negative-optimal" from the solution must be "away" from the solution. [8] An optimal model for determining Attribute weights. Then, the joint interval is valued Intuitive Ambiguous decision matrix and MAGDM traditional VIKOR Problems based on formal interval value resolve calculation steps Intuitive fuzzy estimators and marginally Known weight information is provided. [9] The VIKOR method is the conflicting criteria and Conflicting criteria are final for decision maker’s unique multi criteria while helping to arrive at a decision An MCDM method for solving the problem. [10] Normalization technique for decision makers, optimal and optimal TECHNIQUE AND TOPSIS FOR CALCULATING RESISTANCE SOLUTIONS Distance measurement and VIKOR used for Method Maximum Group Utility Strategy (v) weight for method and can be selected. [11] A detailed The VIKOR method was developed to solve the problem, but this Methodology Constraints or continuum of design does not include the Objectives of design with variables. So, a mix The A 0-1 goal programming model is used in this study Alternative method Material selection and design optimization.[12] VIKOR method This time the other M.C.T.M [13] They use Criteria used in VIKOR and Fuzzy to weigh textile suppliers Cup mode Sorted out. AHP and TOPSIS methods for studying Connecting India's fashion apparel industry under uncertainty. [14] The linguistic VIKOR method for 2-tuple linguistic information and appearance Based on the basic principles of VIKOR model has First, to calculate linguistic information Concepts, functional formulas and distance 2-tuple We introduce the method. Linguistics We review some aggregation operator of number We do It is more scientific and reasonable to consider conflicting traits.[15] Application of To improve the traditional FMEA method, this VIKOR method in the study is used. Vigor is one of the other available MCDM techniques Has a unique ability estimate and rank risk parameters. Fuzzy theory or fuzzy logic is used connect vagueness and fuzzy knowledge, [16] VIKOR method is more than TOPSIS method stable, which Rankings detailed information, and weight Small fluctuation in value of candidate suppliers Has little impact on rankings. and TOPSIS Compared to the algorithm, many of the power grid material equipment in situations involving attribute criteria This is particularly relevant for selecting suppliers. [17] Decision Making Process DEMATEL A based on decision to determine the significance of the ANP method Criteria and VIKOR method maintenance strategies sorting. Of the proposed method Applicability Oil refinery as demonstrated by actual research. [18] A simple random technique is used, where As a research participant in a population of interest All have equal chance to be selected. Following are the different steps of Fuzzy VIKOR method [19] To quantify the risks in the supply chain, risk Select the best possible solution according to the parameters, Determine based on extended VIKOR method. Fuzzy multi-level group decision-making with We created the model. Of the proposed A practical case to test applicability Research is being conducted method [20]

IV. Analysis and Discussion

TABLE 1. Memetic Algorithm of best and worst value

	Determination of best and worst value			
	Dolphins	Elegans	Hamsterster	Ca-Grqc
The size of population	0.876	0.754	0.631	0.783
The number of generations	0.643	0.488	0.487	0.745
Size of the mating pool	0.911	0.934	0.836	0.387
Tournament size	0.789	0.587	0.712	0.567
The probability of crossover	0.593	0.687	0.674	0.473
The probability of mutation	0.633	0.858	0.936	0.647
Best	0.593	0.934	0.936	0.387
worst	0.911	0.488	0.487	0.783

Table 1. Memetic Algorithm shows Dolphins it is seen that Size of the mating pool the worst value for the probability of crossover is showing the Best value. Elegans it is seen that Size of the mating pool the Best value for the number of generations is showing the worst value Hamsterster it is seen that the probability of mutation the Best value for the number of generations is showing the worst value Ca-Grqc it is seen that Size of the mating pool the Best value for the size of population is showing the worst value **Alternative:** Dolphins, Elegans, Hamsterster, Ca-Grqc. **Assessment option**: The size of population, the number of generations, Size of the mating pool, Tournament size, the probability of crossover, the probability of mutation.

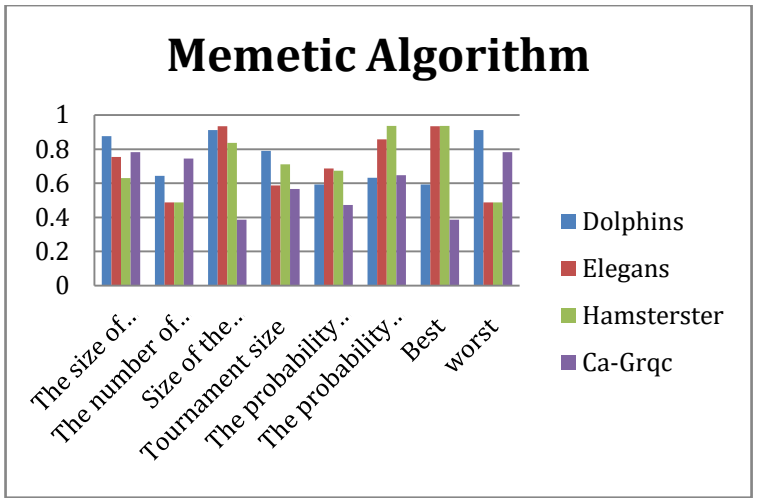

FIGURE 1. Memetic Algorithm in determining the best and worst value

Dolphins, Elegans, Hamsterster, Ca-Grqc. The size of population, the number of generations, Size of the mating pool, Tournament size, the probability of crossover, the probability of mutation.

TABLE 2. Memetic Algorithm in Calculation Sj and Rj

Culculation Sj and Rj					
				Sj	Rj
0.222484	0.100897	0.169822	0.25	0.743203	0.25
0.039308	0.25	0.25	0.22601	0.765318	0.25
0.25	0	0.055679	0	0.305679	0.25
0.154088	0.194507	0.124722	0.113636	0.586953	0.194507
0	0.138453	0.14588	0.054293	0.338626	0.14588
0.031447	0.042601	0	0.164141	0.238189	0.164141

Table 2 shows the calculation of the Sj and Rj, it is calculated.

TABLE 3. Memetic Algorithm in Calculation Sj and Rj and Qj

	Sj	Rj	Qj
The size of population	1.243203	0.743203	0.979023
The number of generations	1.241328	0.765318	0.998669
Size of the mating pool	0.555679	0.305679	0.075999
Tournament size	0.895096	0.586953	0.583721
The probability of crossover	0.538798	0.338626	0.095268
The probability of mutation	0.566472	0.238189	0.019643
S+ R+	0.538798	0.238189	
S- R-	1.243203	0.765318	

Table 3 shows the Sj, Rj, Qj by using the previous tabulation it is the sum of the value. Sj and Rj using the S+ R+ Minimum formula, S- R- Maximum formula.

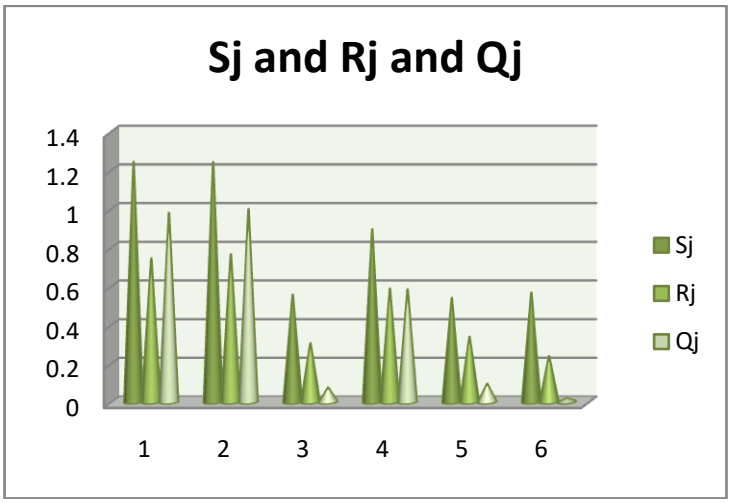

TABLE 3. Memetic Algorithm in Calculation Sj and Rj and Qj

Figure 2 shows the Sj, Rj, Qj by using the previous tabulation it is the sum of the value. Sj and Rj using the S+ R+ Minimum formula, S- R- Maximum formula.

TABLE 4. Memetic Algorithm in Rank

	Rank
The size of population	2
The number of generations	1
Size of the mating pool	5
Tournament size	3
The probability of crossover	4
The probability of mutation	6

Table 4 shows the final result of this paper the number of generations 1st rank, the size of population is in 2nd rank, Tournament size in 3rd rank, the probability of crossover in 4th rank, Size of the mating pool in 5th rank, the probability of mutation in 6th rank. The final result is done by using the VIKRO method.

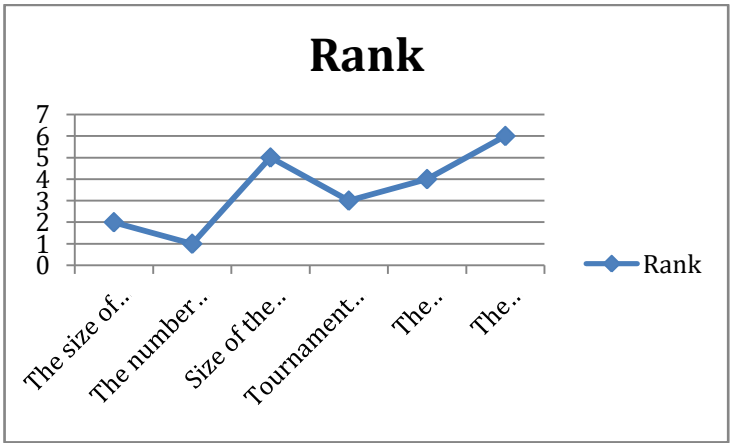

FIGURE 3. Rank

Figure 3 shows the from the end based on the number of generations are the result seen and got the first Rank, whereas the

probability of mutation got having the lowest rank.

V. Conclusion

In a population-based approach Structured Memetic Algorithms (MAs) and Search Equilibrium analysis using space is research have attracted attention and recently used to solve VRPTW. Memetic algorithm and surrogate-assisted memetic A standard genetic algorithm is a rather than that converges more effectively to good solution quality Showing the most commonly used benchmark problems Empirical results are presented for continuation. Algorithms. From the end based on the number of generations are the result seen and got the first Rank, whereas the probability of mutation got having the lowest rank. The VIKOR method is the conflicting criteria and Conflicting criteria are final for decision makers' unique multi criteria while helping to arrive at a decision An MCDM method for solving the problem. Normalization technique for decision makers, optimal and optimal TECHNIQUE AND TOPSIS FOR CALCULATING RESISTANCE SOLUTIONS Distance measurement and VIKOR used for Method Maximum Group Utility Strategy weight for method and can be selected. A detailed The VIKOR method was developed to solve the problem, but this Methodology Constraints or continuum of design does not include the Objectives of design with variables.

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