Lord Rama Devotees Algorithm: A New Human-Inspired Metaheuristic Optimization Algorithm

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and

Lord Rama
GOD

Abstract: Several Human-Inspired Metaheuristic Optimization Algorithms were proposed in literature. But the concept of Devotees-Inspired Metaheuristic Optimization Algorithms is not yet explored. In this article, Lord Rama Devotees Algorithm (LRDA) is proposed which is a new Devotees-Inspired Metaheuristic Optimization Algorithm.

Keywords: Optimization algorithms, Metaheuristics, Humans, Human-Inspired Metaheuristics, Devotees, Devotees-Inspired Metaheuristics, Lord Rama, Lord Rama Devotees Algorithm

1 Introduction

Articles [1] – [11] proposed various Human-Inspired Optimization Algorithms. But the concepts like "Devotion", "Devotees" are not yet explored. This article is based on this research gap. Section 2 shows "Lord Rama Devotees Algorithm (LRDA)".

2 Lord Rama Devotees Algorithm

The population consists of Lord Rama Devotees and non-devotees. Based on random number generated and LordRamaDevoteeProbability, the human is classified into either Lord Rama Devotee or non-devotee. Lord Rama Devotee is not affected by success or failure and he moves in search space without any halt. So velocity and position are always updated as shown in line number 15 and 16 irrespective of anything. But this is not the case for non-devotee. Based on random number generated and NonDevoteeSuccessProbability, non-devotee is classified to facing either success or failure. Non-devotee will not update velocity and position and moves into halted state when he faces failure as shown in line number 25. He updates velocity and position when he faces success as shown in line number 21 and 22. Hence failure or success is not a matter for Lord Rama Devotee. But non-devotee will stop progress when he faces failure.

Procedure: Lord Rama Devotees Algorithm (LRDA)

1) Initialize all devotees
2) iterations = 0
3) **do**
4) **for** each devotee i **do**
5) **If** ($f(x_i) < f(pbest_i)$) **then**
6) $pbest_i = x_i$
7) **end if**
8) **if** ($f(pbest_i) < f(gbest)$) **then**
9) $gbest = pbest_i$
10) **end if**
11) **end for**
12) **for** each devotee i **do**
13) **if** (random(0,1) < LordRamaDevoteeProbability) **then** // Lord Rama devotee
14) **for** each dimension d **do**
15) $v_{i,d} = w*v_{i,d} + C_1*Random(0,1)*(pbest_{i,d} - x_{i,d}) + C_2*Random(0,1)*(gbest_d - x_{i,d})$
16) $x_{i,d} = x_{i,d} + v_{i,d}$
17) **end for**
18) **else** // Non devotee
19) **if** (random(0,1) < NonDevoteeSuccessProbability) **then**
20) **for** each dimension d **do**
21) $v_{i,d} = w*v_{i,d} + C_1*Random(0,1)*(pbest_{i,d} - x_{i,d}) + C_2*Random(0,1)*(gbest_d - x_{i,d})$
22) $x_{i,d} = x_{i,d} + v_{i,d}$
23) **end for**
24) **else** // Non devotee with failure
25) // non devotee with failure doesnot update position and velocity
26) **end if**
27) **end if**
28) **end for**
29) iterations = iterations + 1
30) **while** (termination condition is false)

3 Results

Human Bhagavad Gita Particle Swarm Optimization (HBGPSO) proposed in [7] and Lord Rama Devotees Algorithm (LRDA) proposed in this article are mathematically equivalent. According to [7], HBGPSO performed as good as PSO. Hence Lord Rama Devotees Algorithm (LRDA) performed as good as PSO as it is mathematically equivalent to HBGPSO.

4 Conclusions

In this article, a new metaheuristic optimization algorithm titled “Lord Rama Devotees Algorithm (LRDA)” is proposed. Results show that proposed LRDA algorithm performed as good as PSO

algorithm. In this article, PSO is modified with the concept of “devotion”, “devotees” to get LRDA algorithm. Hence LRDA algorithm is a Hybrid-PSO Algorithm. This article is a starting point of “Devotees-Inspired Metaheuristic Optimization Algorithms”. Hence it is ideal for future research scientists to create algorithms like LRDA from scratch instead of modifying existing algorithms like PSO as done in this article.

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