

Peer Review

Review of: "PSO and the Traveling Salesman Problem: An Intelligent Optimization Approach"

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In this work, it is included that [PSO and the Traveling Salesman Problem: An Intelligent Optimization Approach](#). It is a topic of interest to researchers in the related areas, but the paper needs some improvement before acceptance for publication. My detailed comments are as follows:

1. **Traveling Salesman Problem (TSP) and its applications in logistics, route planning, and bioinformatics.**
2. **Adaptation of PSO to Discrete Domain:** The authors demonstrate an understanding of the challenges in applying Particle Swarm Optimization (PSO) to discrete problems by treating city orders as permutations and incorporating 2-opt and 3-opt local search techniques.
3. **Well-Structured Paper:** The paper follows a logical structure, progressing from an introduction to PSO and TSP, methodology, results, and conclusions, which enhances readability.
4. **Preliminary Demonstration:** The small-scale experiment with a five-city instance provides an initial indication of PSO's capability in solving TSP instances.
5. **Limited Experimental Scope:** The study is confined to a single TSP instance with five cities, making it insufficient to draw broader conclusions about PSO's performance.
6. **Incomplete Pseudocode:** The pseudocode in Section 4 is truncated and lacks critical details, such as loop structures, velocity updates, and integration of local search, making replication difficult.
7. **Weak Comparison with Other Methods:** Although the paper mentions comparisons with Genetic Algorithms (GA) and Simulated Annealing (SA), it does not provide concrete results, metrics, or data to substantiate these claims.

8. **Lack of Discussion on Larger Instances:** The paper briefly acknowledges PSO's difficulty in handling larger instances due to local optima but does not analyze the reasons behind this or compare it with other methods.
9. **Unjustified Parameter Selection:** The choice of parameters (e.g., 30 particles, $\omega = 0.8$, $c_1 = c_2 = 2$) is not explained, raising concerns about the generalizability of the results.
10. **Missing Figures and Graphs:** For example, Figure 1, which supposedly illustrates the five-city TSP solution, is not included in the document.
11. **Insufficient Mathematical Explanation:** The transition from continuous PSO equations to the discrete TSP adaptation is not fully explained, leaving gaps in how velocity and position updates generate valid permutations.
12. **Unclear Novelty:** The paper references prior research on PSO for TSP (e.g., Ghosh and Dehuri, 2011) but does not clearly articulate what distinguishes this study from existing work.

Declarations

Potential competing interests: No potential competing interests to declare.