Dear Editors:

We would like to submit the enclosed manuscript entitled "Automated Design of Metaheuristic Algorithms: A Survey", which we wish to be considered for publication in "Transactions on Machine Learning Research". No conflict of interest exists in the submission of this manuscript, and all listed authors of the manuscript approve its publication. I would like to declare on behalf of my co-authors that the work described is original research that has not been published previously and not under consideration for publication elsewhere, in whole or in part.

Metaheuristics have gained great success in academia and practice. Manually designing metaheuristic algorithms for solving a target problem is criticized for being laborious, error-prone, and requiring intensive specialized knowledge. This gives rise to increasing interest in automated design of metaheuristic algorithms. This manuscript provides a broad picture of automated design of metaheuristic algorithms, by conducting a survey on the common grounds and representative techniques in terms of design space, design strategies, performance evaluation strategies, and target problems in this field. The contributions of the manuscript include:

1. We provide a taxonomy of automated design of metaheuristic algorithms by formalizing the automated design process into four parts, i.e., design space, design strategies, performance estimation strategies, and targeted problems.

2. We review the common grounds and representative techniques concerning the four parts of the taxonomy, respectively. We further discuss the strengths, weaknesses, challenges, and usability of these techniques.

3. We point out research trends in the field.

Hopefully, this survey can provide a comprehensive and meticulous understanding of the automated design of metaheuristic algorithms, inspire interest in leveraging automated design techniques to make high-performance algorithms accessible to a broader range of researchers and practitioners, and boost automated design innovations to fuel the pursuit of autonomous and general artificial intelligence.

We deeply appreciate your consideration of our manuscript, and we look forward to receiving comments from the reviewers.

Best wishes,
Anonymous authors