

Dear Editor-in-Chief,

I hope this letter finds you well. I would like to submit the manuscript entitled "BESO and SESO: Comparative analysis of spatial structures considering self-weight and structural reliability" for consideration for publication in the Applied Sciences Journal.

This study presents a comparative analysis between Bidirectional Evolutionary Structural Optimization (BESO) and Evolutionary Structural Smoothing Optimization (SESO), simultaneously integrating Reliability-Based Topological Optimization (RBTO) and the structure's self-weight in the context of three-dimensional elasticity. Due to the importance of uncertainties in creating a more realistic structural design, we consider geometry, volume fraction, modulus of elasticity, compliance and applied loads as random variables, with normal distribution. By adopting the First Order Reliability Method (FORM), the probability of failure is calculated based on the reliability index. Furthermore, self-weight is considered in problems involving large structures in civil engineering, especially bridges, resulting in a more reliable optimal configuration for the project. A series of examples are presented to validate the proposed methods, demonstrating their efficiency and robustness.

I believe this manuscript is in line with the scope of the Applied Sciences Journal, contributing significantly to the field of topology optimization and structural engineering. I am confident that the methodologies and results presented will be of great interest to the magazine's readers.

Thank you for considering my manuscript for publication in Applied Sciences Journal. I am available to provide any additional information or clarifications that may be needed during the review process.

Yours sincerely,

Hélio Luiz Simonetti