

Peer Review

Review of: "Local and Global Optima: Sheaves and Polynomial Approximations"

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From my viewpoint, the article is well-written and approaches the subject in a deep and sound manner. Besides, the mathematical basis is robust and presents a good theoretical foundation - very positive features.

The underlying theme is also very interesting and useful, although rarely explored in potential applications, which abound in all areas of knowledge.

However, I have some observations and suggestions:

1 - Although it is stated, "An evolutionary approach is not the focus of this paper," I firmly believe that certain evolutionary techniques are very effective in global optimization tasks, including those related to game theory.

2 - Polynomial approximation is certainly a very general and useful paradigm, with strong theoretical foundations, etc. It occurs, however, that in medium to large-scale problems, it tends to "explode" in terms of the number of parameters to fit and computational demand, sometimes leading to difficult scenarios.

3 - Another issue relates to the theorem's hypotheses about cost functions.

It happens that most of such functions are extremely complex, and it is very difficult to theoretically analyze them - so, almost always, people simply disregard this "detail" in practice, leading to many deviations in the final results. In this type of scenario, evolutionary approaches may help a great deal.

My conclusion is that the article presents great quality but could be significantly improved by means of certain changes.

Declarations

Potential competing interests: No potential competing interests to declare.