A Comparative Analysis of a Custom Optimization Experiment with Confidence Intervals in Anylogic and Optquest

Authors : Felipe Haro, Soheila Antar

Abstract : This paper introduces a custom optimization experiment developed in AnyLogic, based on genetic algorithms, designed to ensure reliable optimization results by incorporating Montecarlo simulations and achieving a specified confidence level. To validate the custom experiment, we compared its performance with AnyLogic's built-in OptQuest optimization method across three distinct problems. Statistical analyses, including Welch's t-test, were conducted to assess the differences in performance. The results demonstrate that while the custom experiment shows advantages in certain scenarios, both methods perform comparably in others, confirming the custom approach as a reliable and effective tool for optimization under uncertainty.

Keywords : optimization, confidence intervals, Montecarlo simulation, optQuest, AnyLogic
Conference Title : ICASMA 2025 : International Conference on Applied Simulation, Modelling and Analysis
Conference Location : Lisbon, Portugal
Conference Dates : April 10-11, 2025