

Posters

An evolutionary approach to pessimistic bilevel optimization problems

Presenter: **Margarita Antoniou**

Schedule: **Thu, 16:30 - 17:45, B100 - 4013**

When dealing with bilevel optimization, there are two common approaches for making an assumption regarding the lower-level behavior; the optimistic and the pessimistic approach. In the optimistic approach, it is assumed that the lower-level will choose a solution that is favorable for the upper-level, while in the pessimistic approach, it is assumed that the lower-level may choose the solution not favorable to the upper level. There are numerous studies that make use of Evolutionary Algorithms (EAs) to successfully solve bilevel problems. To date, these studies have mostly focused on the optimistic variant of the problem. This work aims to extend the usage of EAs to the pessimistic variant as well. The proposed approach utilizes a nested differential evolution to handle both the upper and the lower level. To ensure convergence to the pessimistic solution, a penalty parameter is used to penalize the lower-level objective based on the values of the upper-level objective. The nested algorithm achieves good convergence accuracy for a number of known test functions, demonstrating the effectiveness of the proposed approach. The findings highlight the potential of using EAs to solve pessimistic bilevel optimization problems.

This poster is based on joint work with Ankur Sinha and Gregor Papa.