

# **CEC 2020 Competition Proposal on Multimodal Multiobjective Optimization**

In multiobjective optimization problems, there may exist two or more global or local Pareto optimal sets (PSs) and some of them may correspond to the same Pareto Front (PF). These problems are defined as multimodal multiobjective optimization problems (MMOPs).

It is necessary to study multimodal multi-objective optimization. Arguably, finding one of these multiple PSs may be sufficient to obtain an acceptable solution for some problems. However, failing to identify more than one of the PSs may prevent the decision maker from considering solution options that could bring about improved performance.

Given that the study of multimodal multiobjective optimization (MMO) is still in its emerging stages, although many real-world applications are likely to be amenable to treatment as a MMOP, to date the researchers have ignored such formulations. A suite of MMOPs were released in CEC 2019. However, the problems with and without local PSs are mixed together and the number of local or global PSs need to be obtained is not specified.

In this competition, the problems with and without local PSs are separated and the number of local or global PSs need to be obtained is specified. If several local or global PSs need to be obtained, the population size is increased correspondingly.

This competition is devoted to the novel approaches, algorithms and techniques for solving multimodal multiobjective optimization test problems.

We encourage all researchers to test their algorithms on the CEC'20 test suite. The participants are required to send the final results in the format introduced in the technical report to the organizers and we will present an overall analysis and comparison based on these results. Papers on novel concepts that help us in understanding problem characteristics are also welcome.

## **Organizers:**

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He received the B.A degree, Postgraduate Certificate and M.A degree in Electrical and Information Engineering from the University of Cambridge, UK in 1990, 1992 and 1994, respectively. After completing his PhD research in 1995, he served as a pre-doctoral Research Assistant in the Dept. of Electrical Engineering, University of Sydney in 1995–96 and a lecturer in the Dept. of Computer Science and Electrical Engineering, University of Queensland in 1996–99. He moved to Singapore in 1999. He was an Editorial Board Member of the Evolutionary Computation Journal, MIT Press (2013-2018) and an associate editor of the IEEE Trans on Cybernetics (2012 - 2018). He is an associate editor of Applied Soft Computing (Elsevier, 2018-),

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