

CEC 2016 Special Session on Real-Parameter Single Objective Computationally expensive Optimization

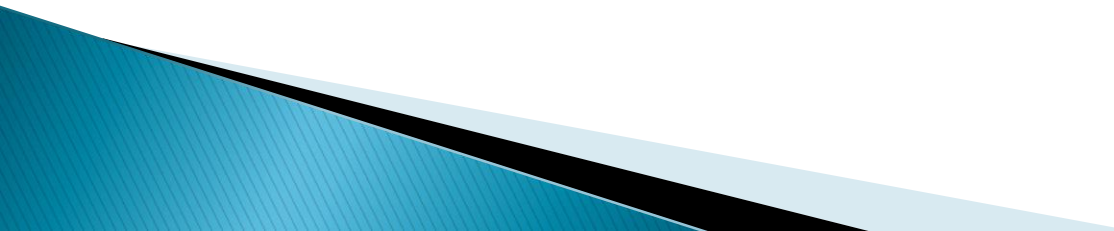
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July 24th 2016

Content

- ▶ Test suite and ranking
- ▶ Competition results
- ▶ Performance analysis

Algorithms

- ▶ 20 papers were accepted
 - ▶ 6 algorithms are involved in the expensive cost competition
 - ▶ 9 algorithms are involved in the CEC 2014 benchmark problems
 - ▶ 5 algorithms are involved in the CEC 2015 benchmark problems
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Test suite and ranking

▶ Test Suite

- 15 functions
- 2 dimensions: 10d, 30d
- 4 types:
 - Unimodal functions: TF1, TF2
 - Simple Multimodal functions: TF3–TF9
 - Hybrid functions: TF10, TF11, and TF12
 - Composition functions: TF13, TF14, and TF15

Test suite and ranking

▶ Ranking

- F^* removed from the function objectives
- mean values and median values
- all 15 problems for 10 and 30 dimensions
- favor those algorithm can solve complicate problems

$$\text{Total Score} = \sum_{i=1}^{30} \text{mean}(f_a) \Big|_{D=10} + \sum_{i=1}^{30} \text{median}(f_a) \Big|_{D=10} + \sum_{i=1}^{30} \text{mean}(f_a) \Big|_{D=30} + \sum_{i=1}^{30} \text{median}(f_a) \Big|_{D=30}$$

$$f_a = 0.5 \times (f_{\text{MAXFES}} + f_{0.5\text{MAXFES}})$$

Algorithms

ID	Algorithm	Paper Title
E-16423	RYYPO	Reduced YinYang Pair Optimization and its Performance on the CEC 2016 Expensive Case
E-16425	SPMGTLO	Single Phase MultiGroup Teaching Learning Algorithm for Computationally Expensive Numerical Optimization
E-16437	AsBeC_tuned	A hybrid ABC for expensive optimizations: CEC 2016 competition benchmark
E-4208223	SHTS	Simultaneous Heat Transfer Search for Computationally Expensive Numerical Optimization
-----	MVMO	Solving the CEC2016 Real-Parameter Single Objective Optimization Problems through MVMO-PHM (Technical Report)
E-16357	BaMSOO	Analysis of the Bayesian Multi-Scale Optimistic Optimization on the CEC2016 and BBOB Testbeds

Ranking Results

Algorithm	Total Score	Rank
RYYPO	9.5690E+08	3
SHTS	4.8284E+10	6
AsBeCTuned	4.2397E+05	2
MVMO	1.2774E+05	1
SPMGTLO	2.3550E+10	5
BaMSOO	2.3302E+10	4

	Best
	Second
	Third