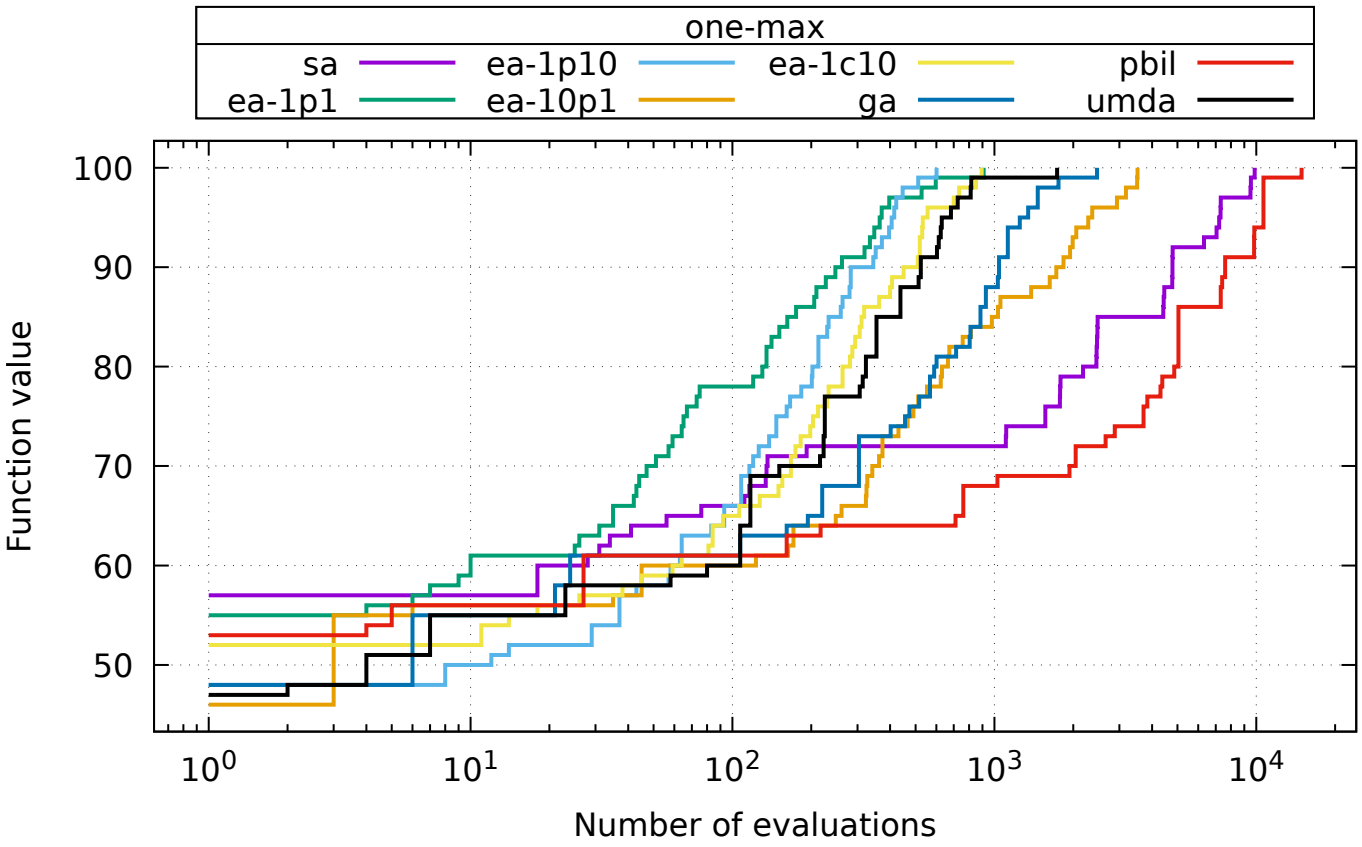
HNCO
Evolution of maximum
of various black box optimization algorithms

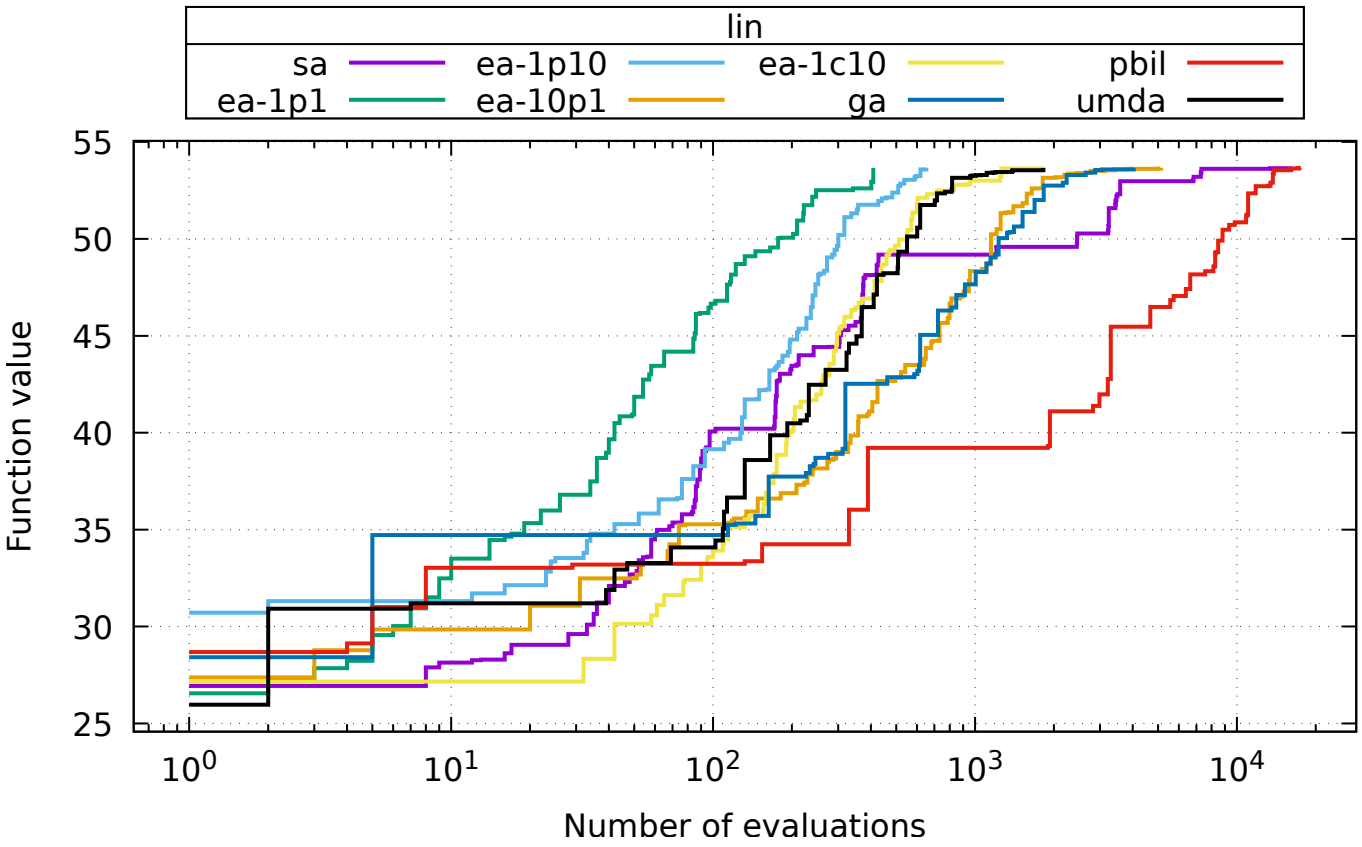
August 15, 2021

Contents

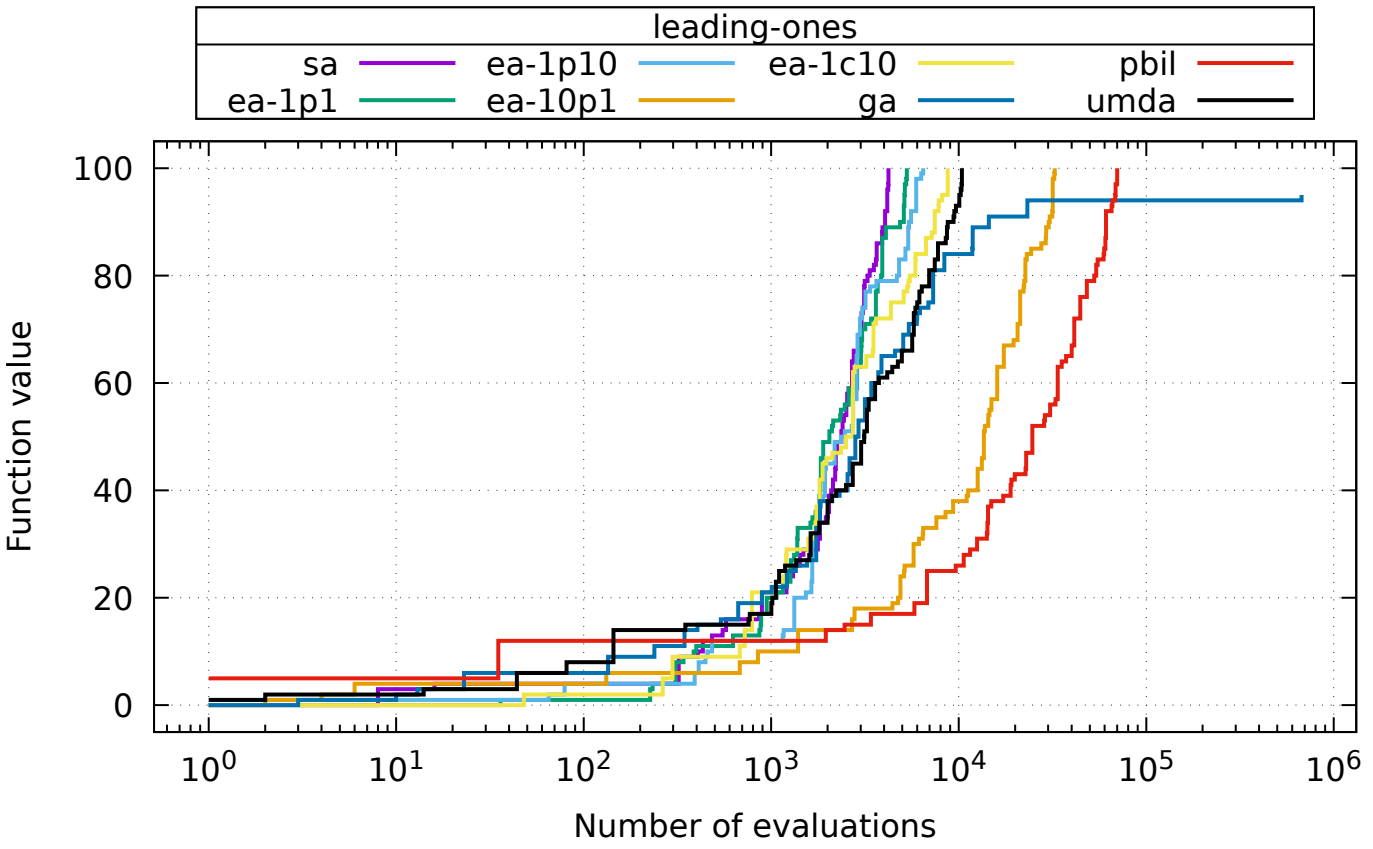
1 one-max



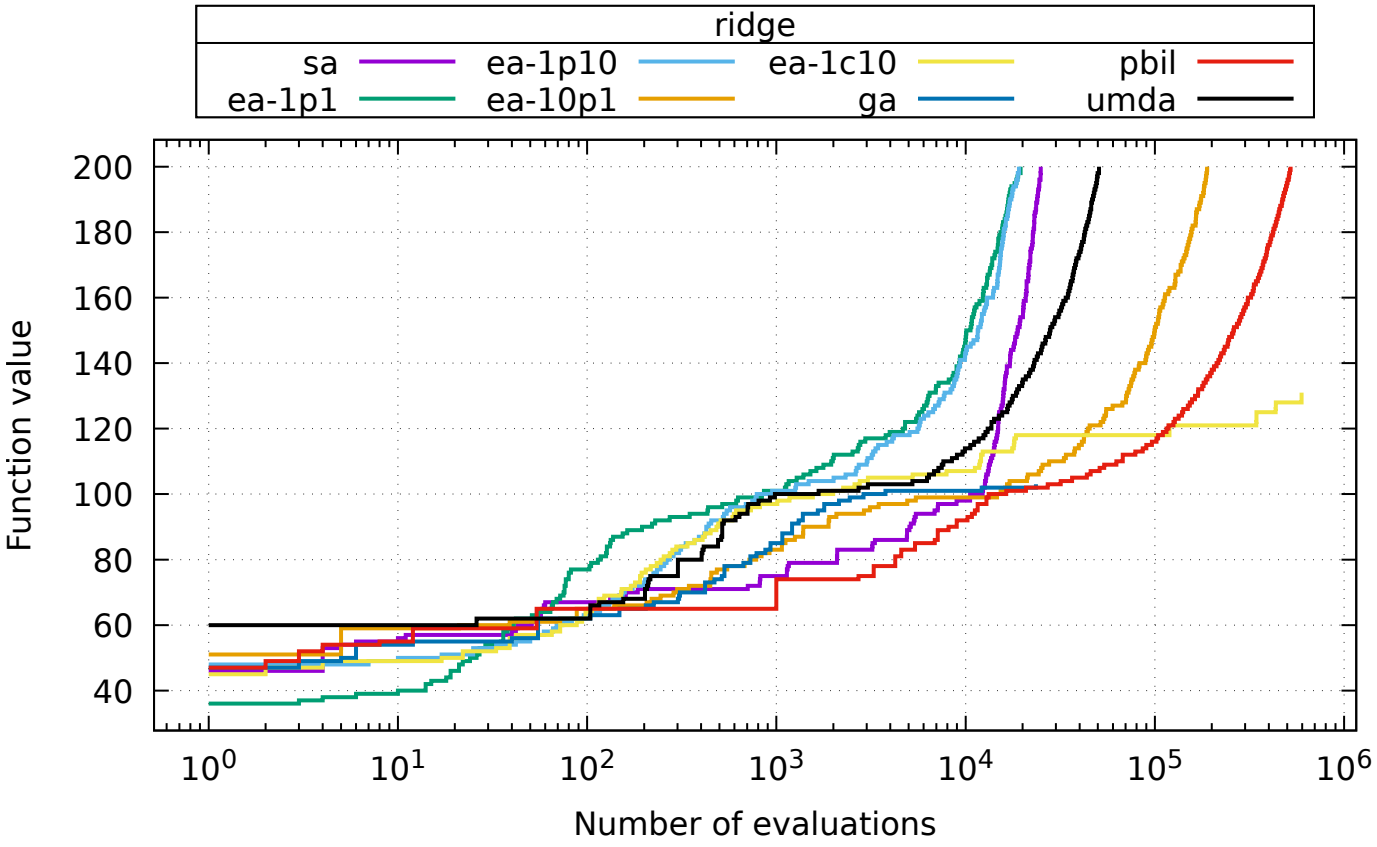
2 lin



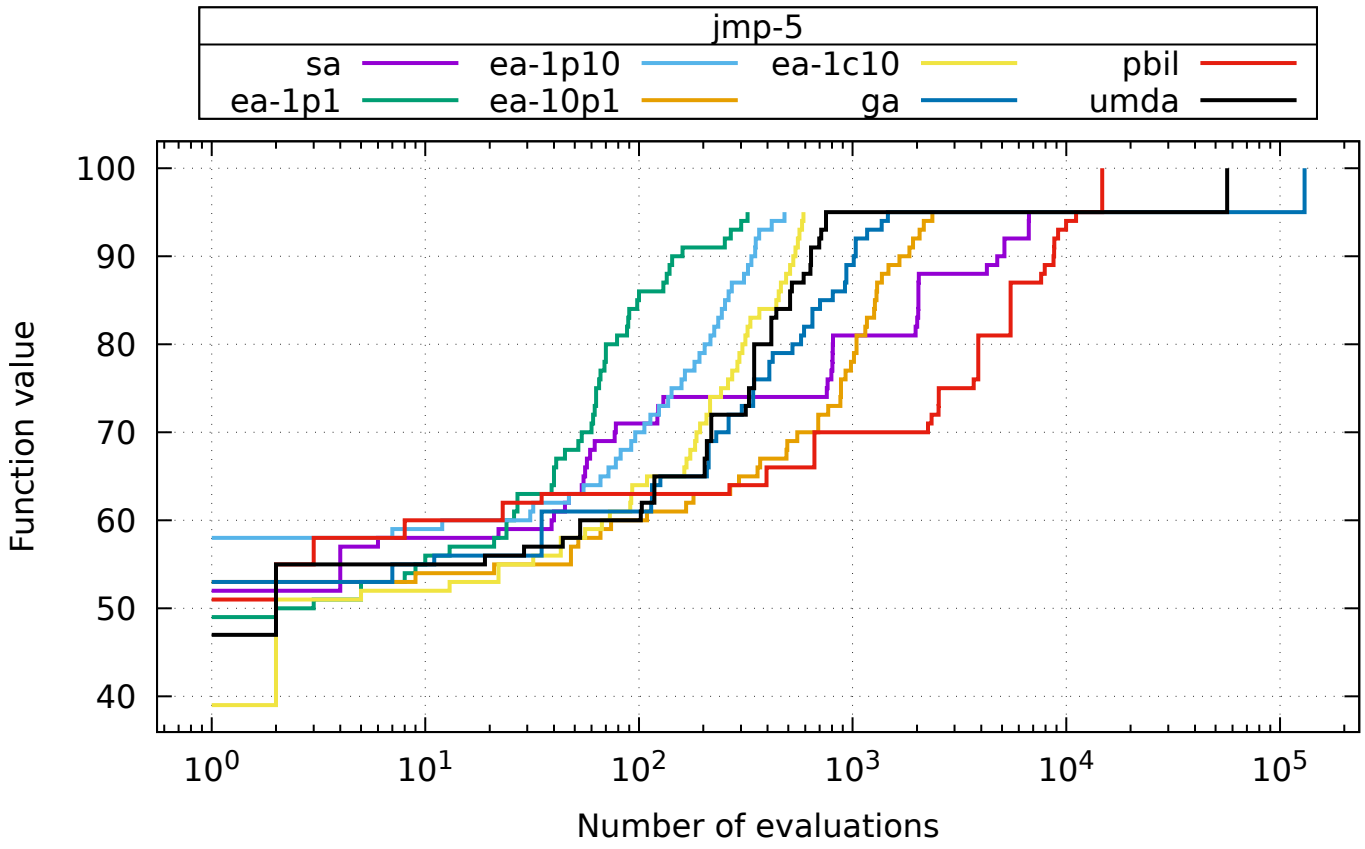
3 leading-ones



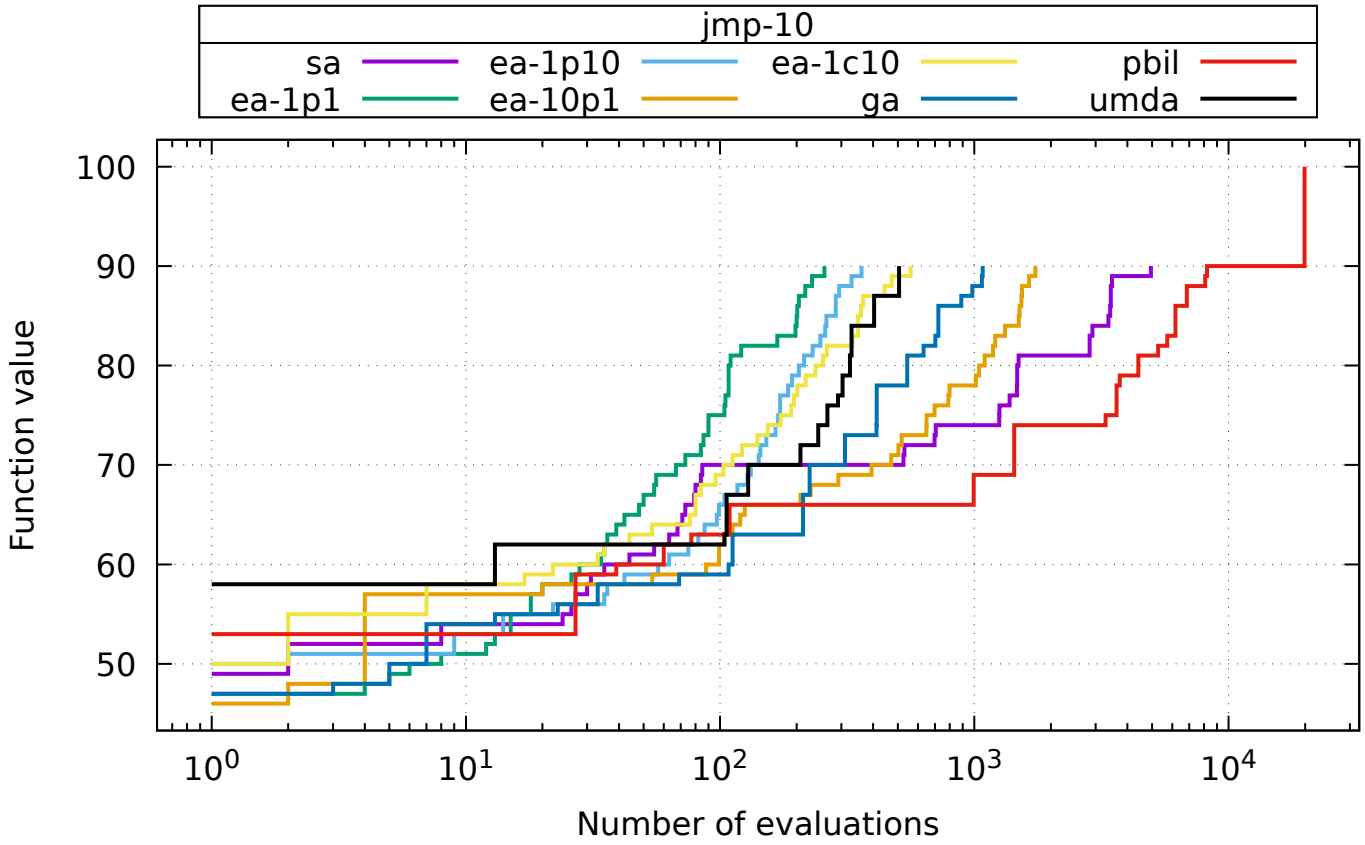
4 ridge



5 jmp-5



6 jmp-10



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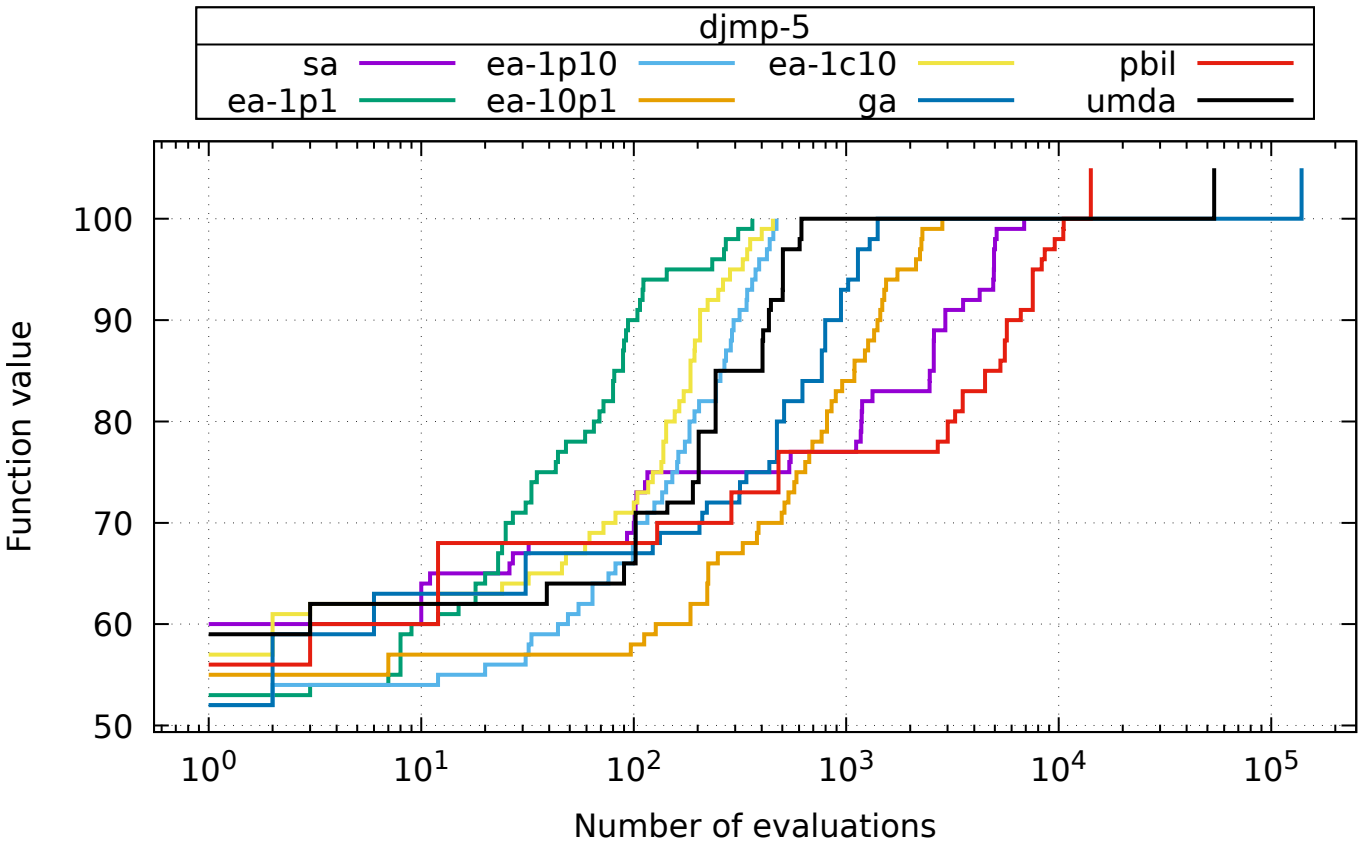

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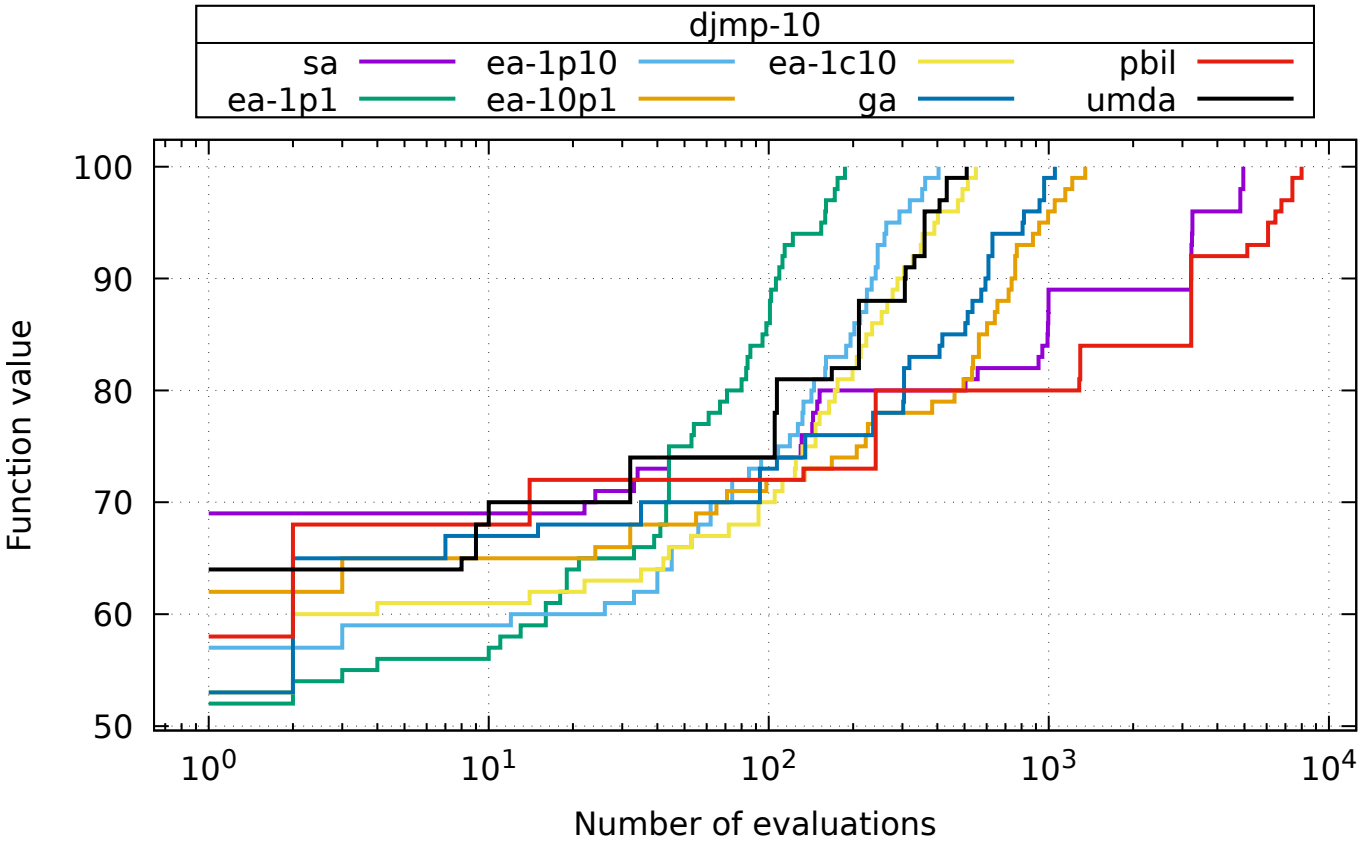

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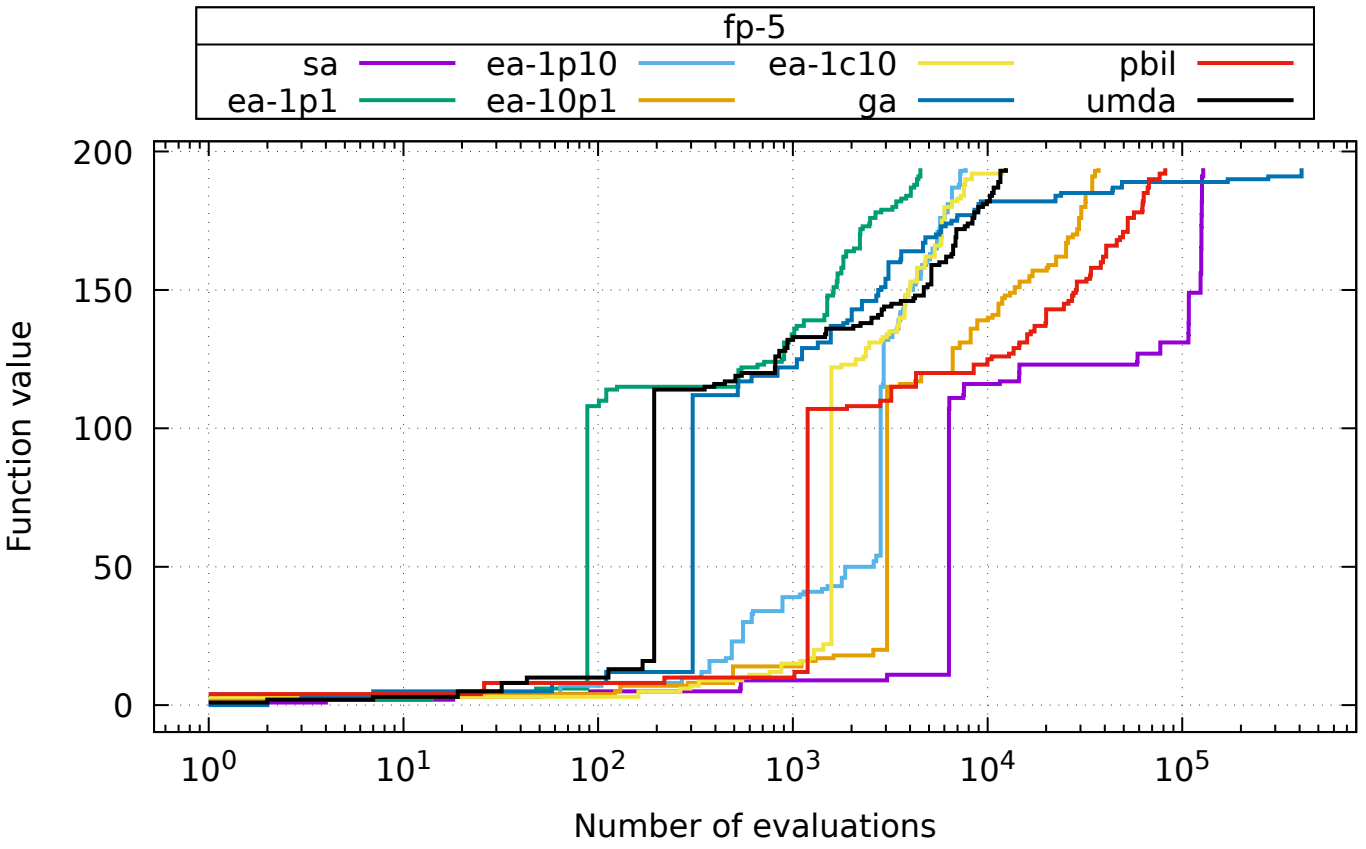
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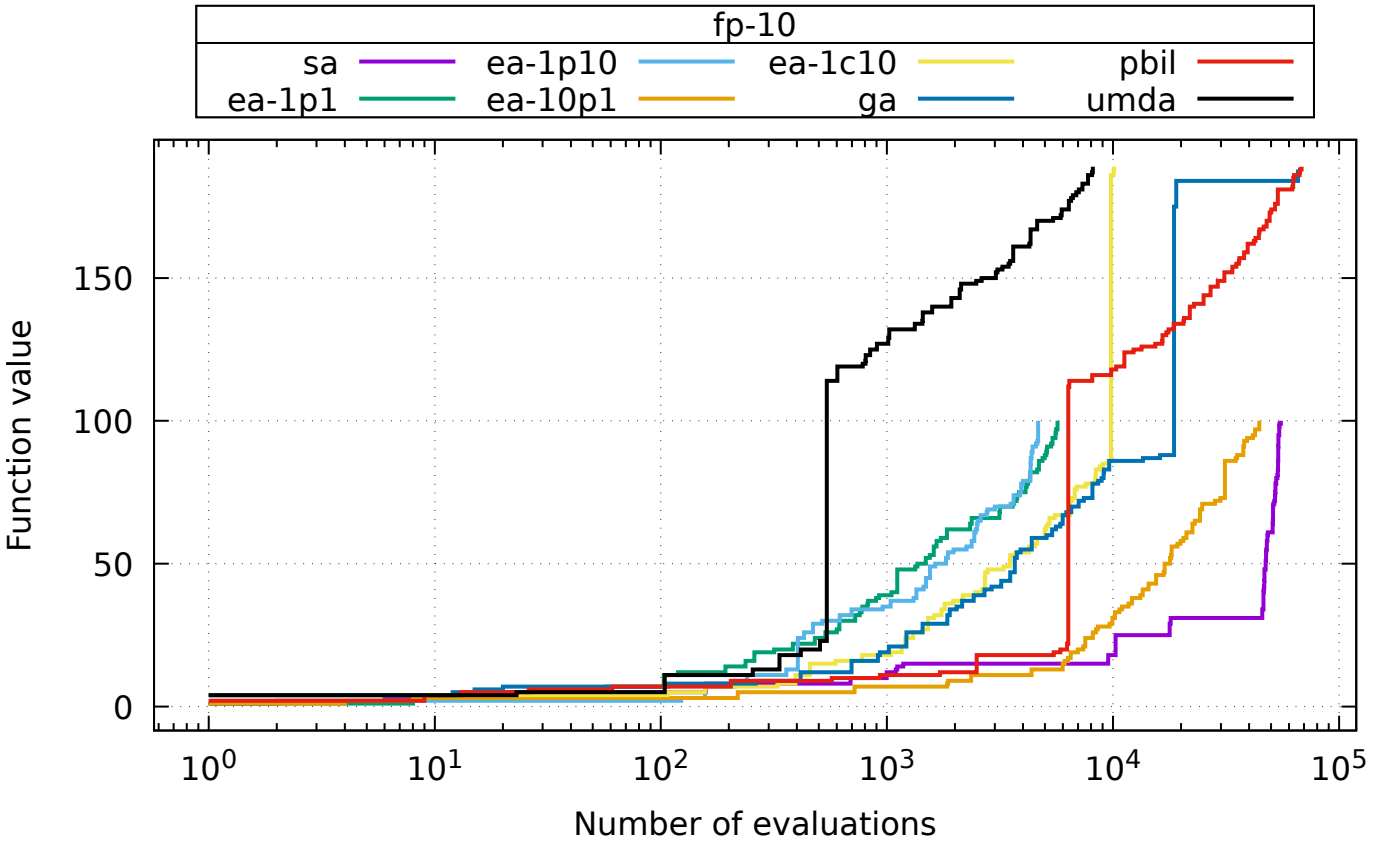
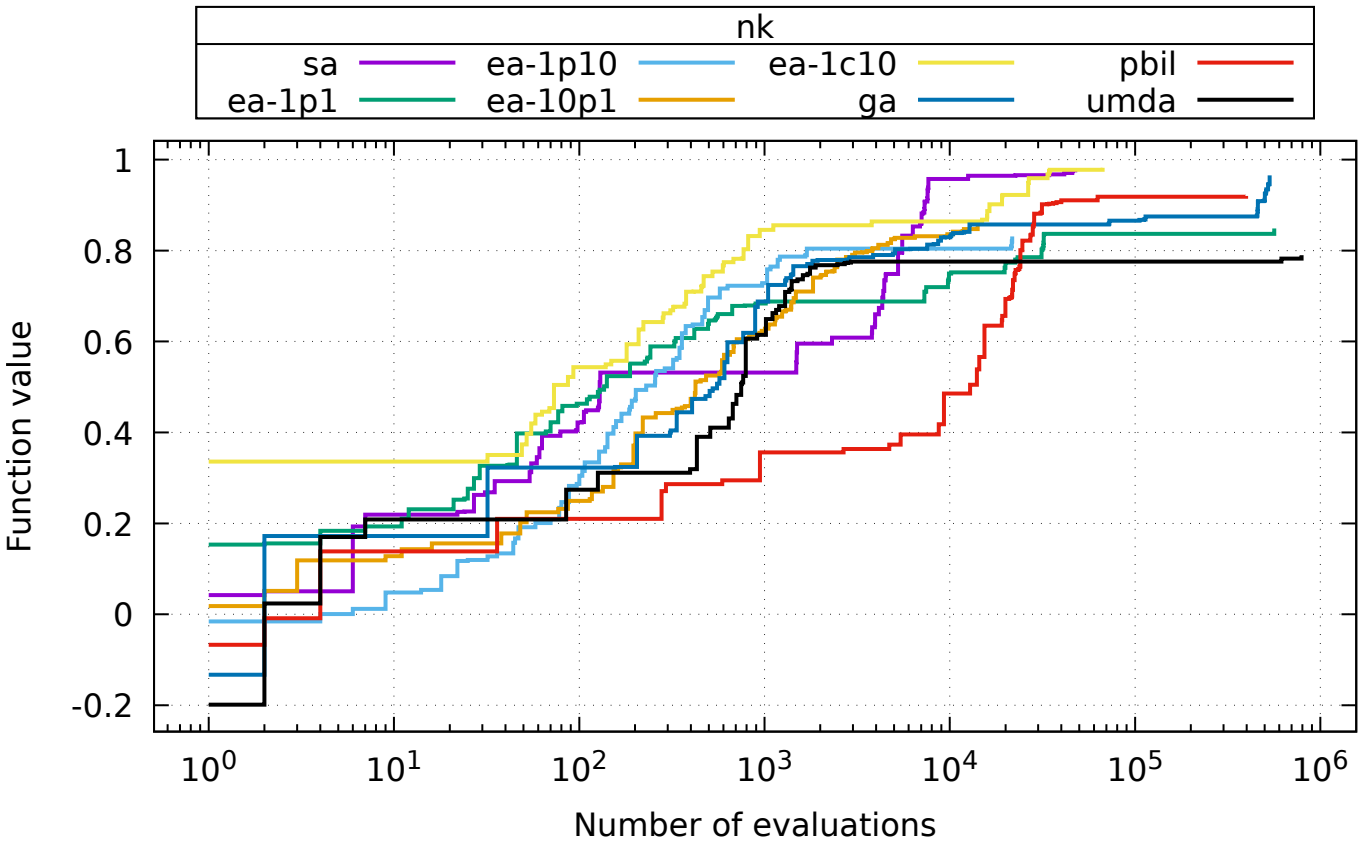
sa
ea-1p10
ea-1c10
pbil
ea-1p1
ea-10p1
ga
umda
Function value
Number of evaluations
200
150
100
50
0
10^0
10^1
10^2
10^3
10^4
10^5

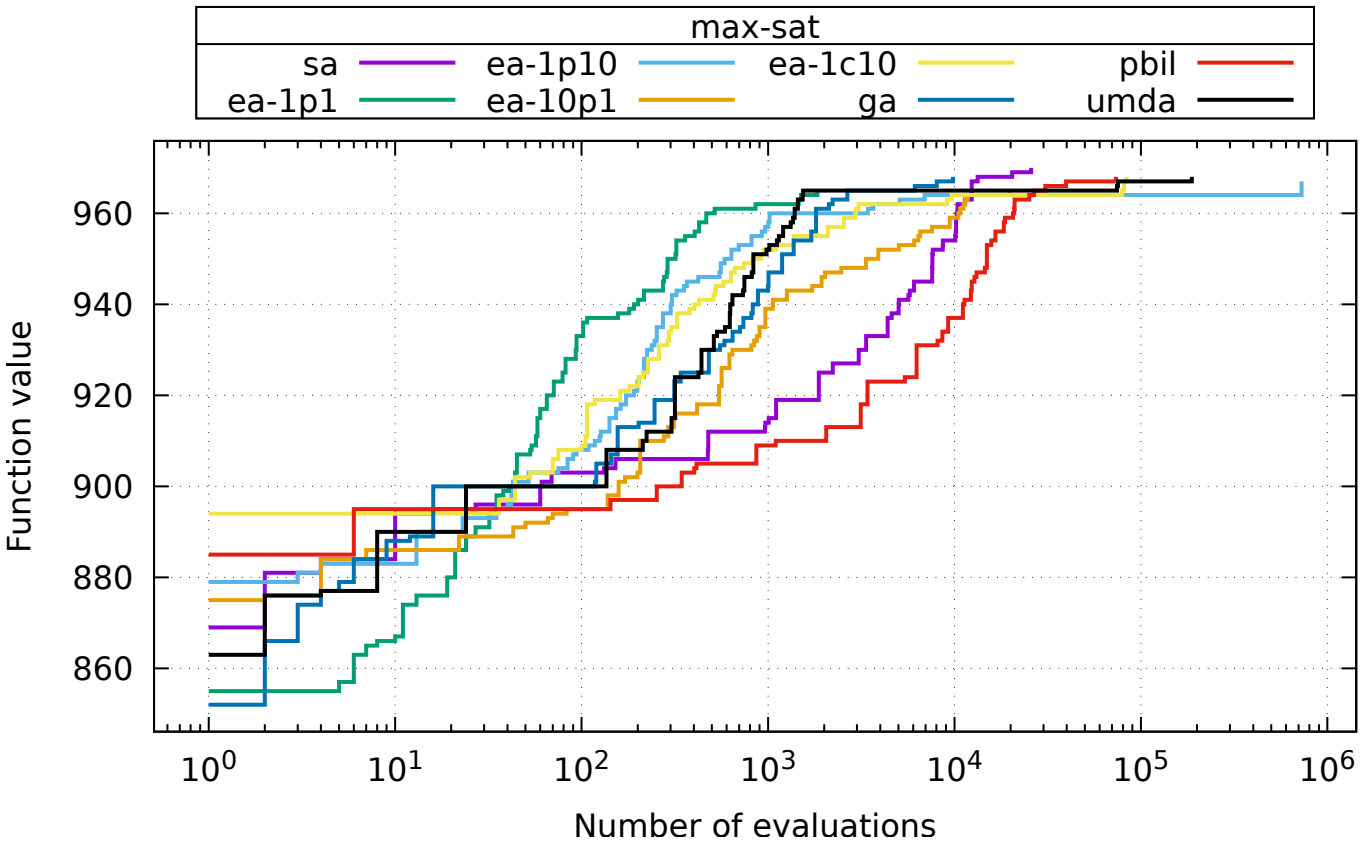
10 fp-10


fp-10
sa
ea-1p10
ea-1c10
pbil
ea-1p1
ea-10p1
ga
umda
Function value
Number of evaluations
150
100
50
0
10^0
10^1
10^2
10^3
10^4
10^5

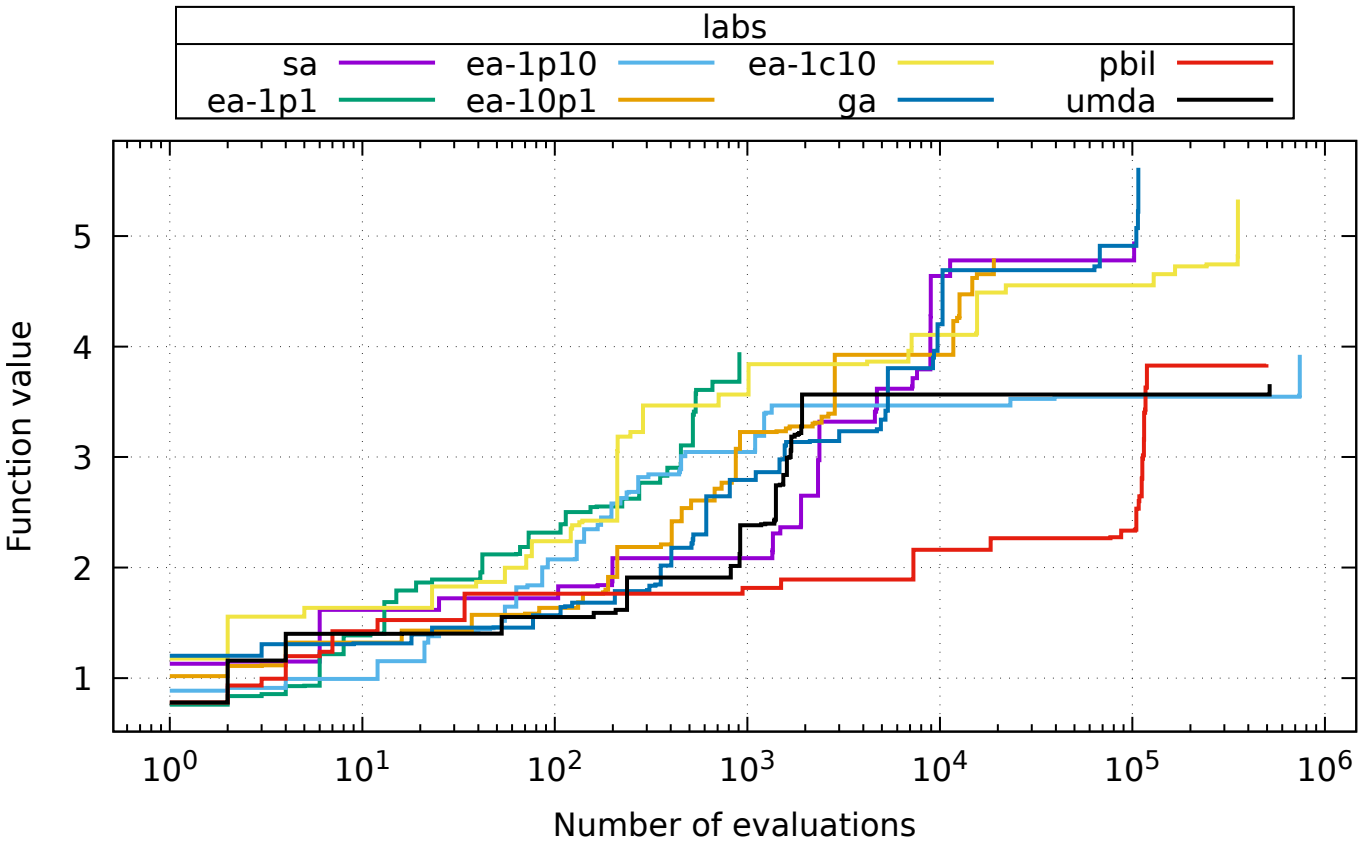
11 nk



12 max-sat



13 labs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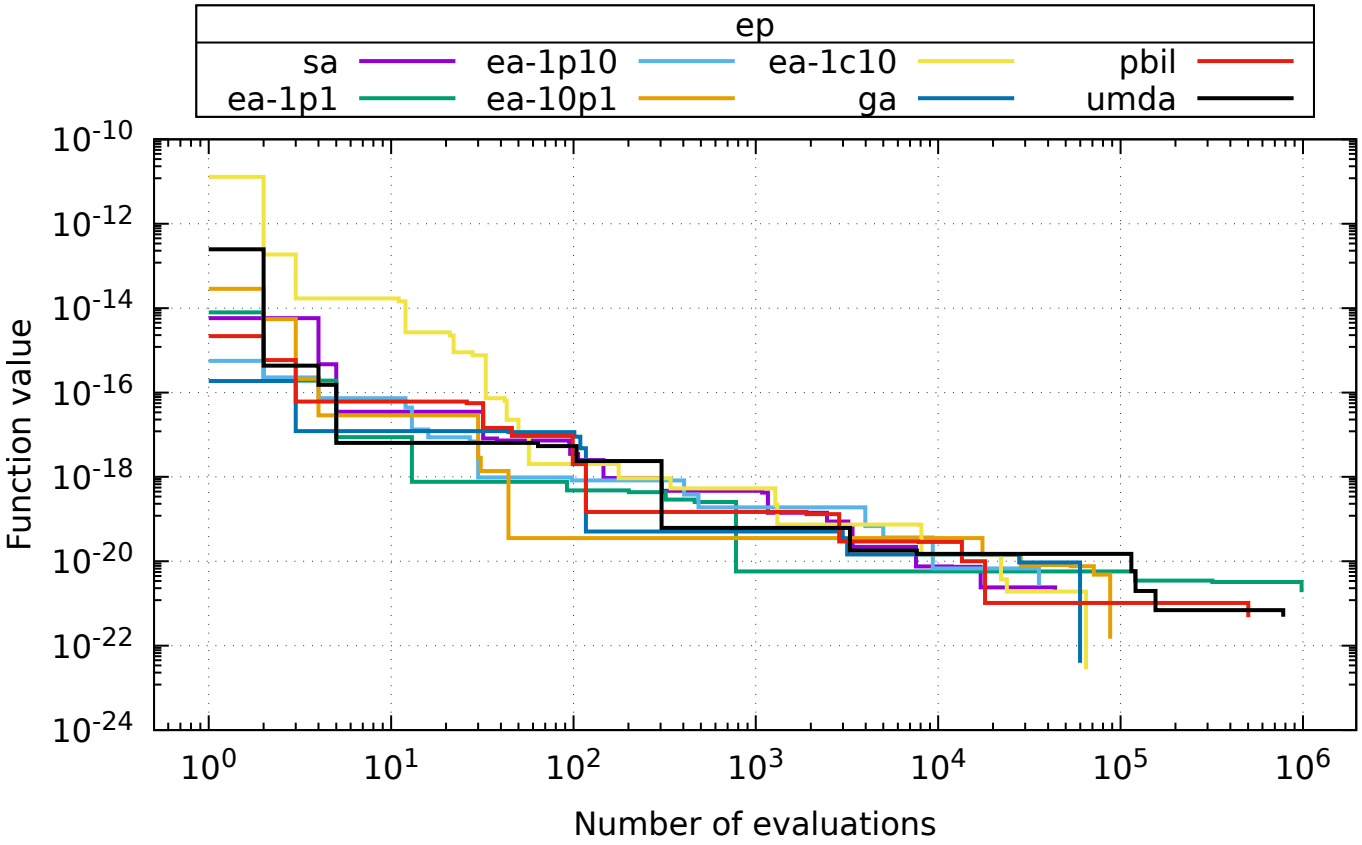
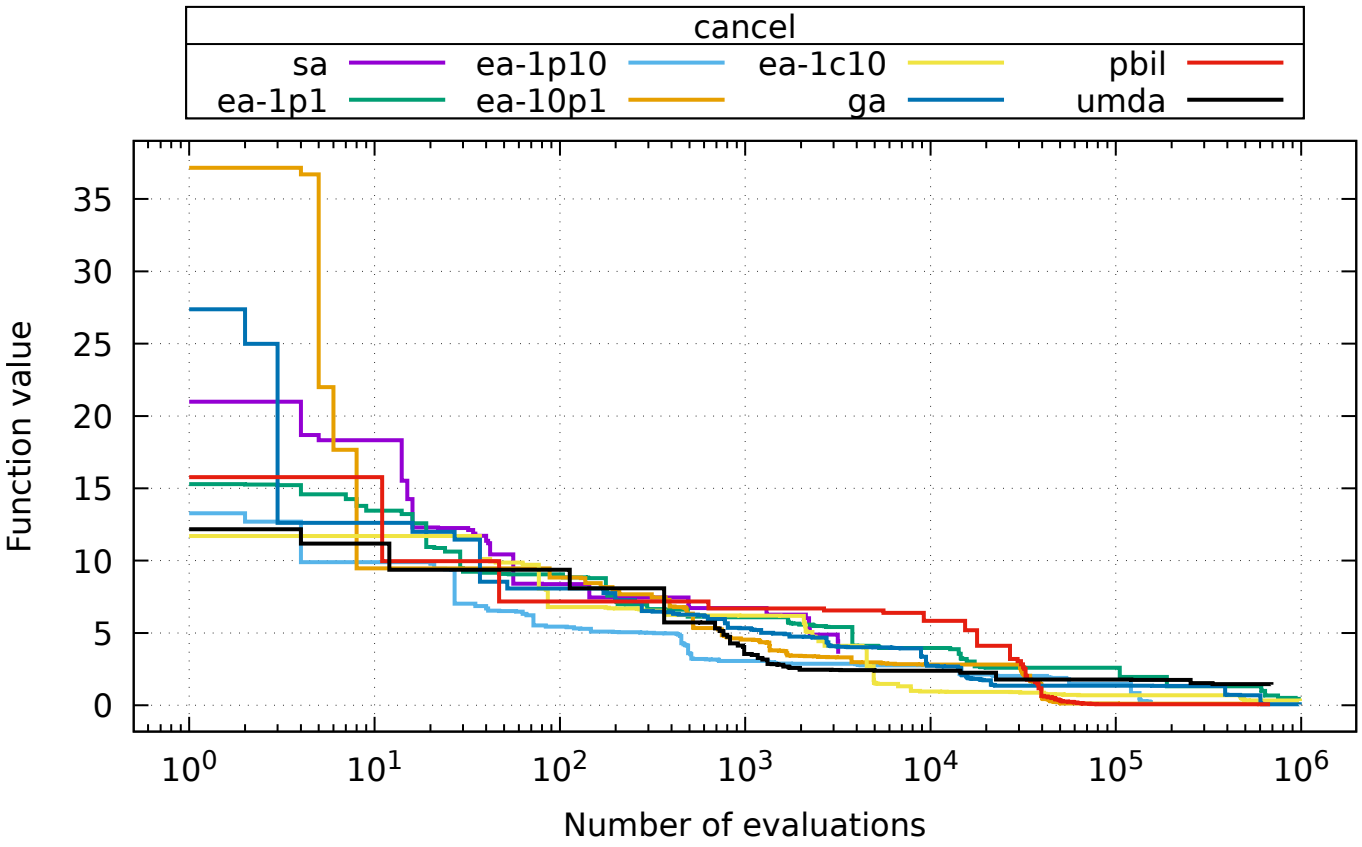
ea-1c10
pbil
ea-1p1
ea-10p1
ga
umda
Function value
Number of evaluations

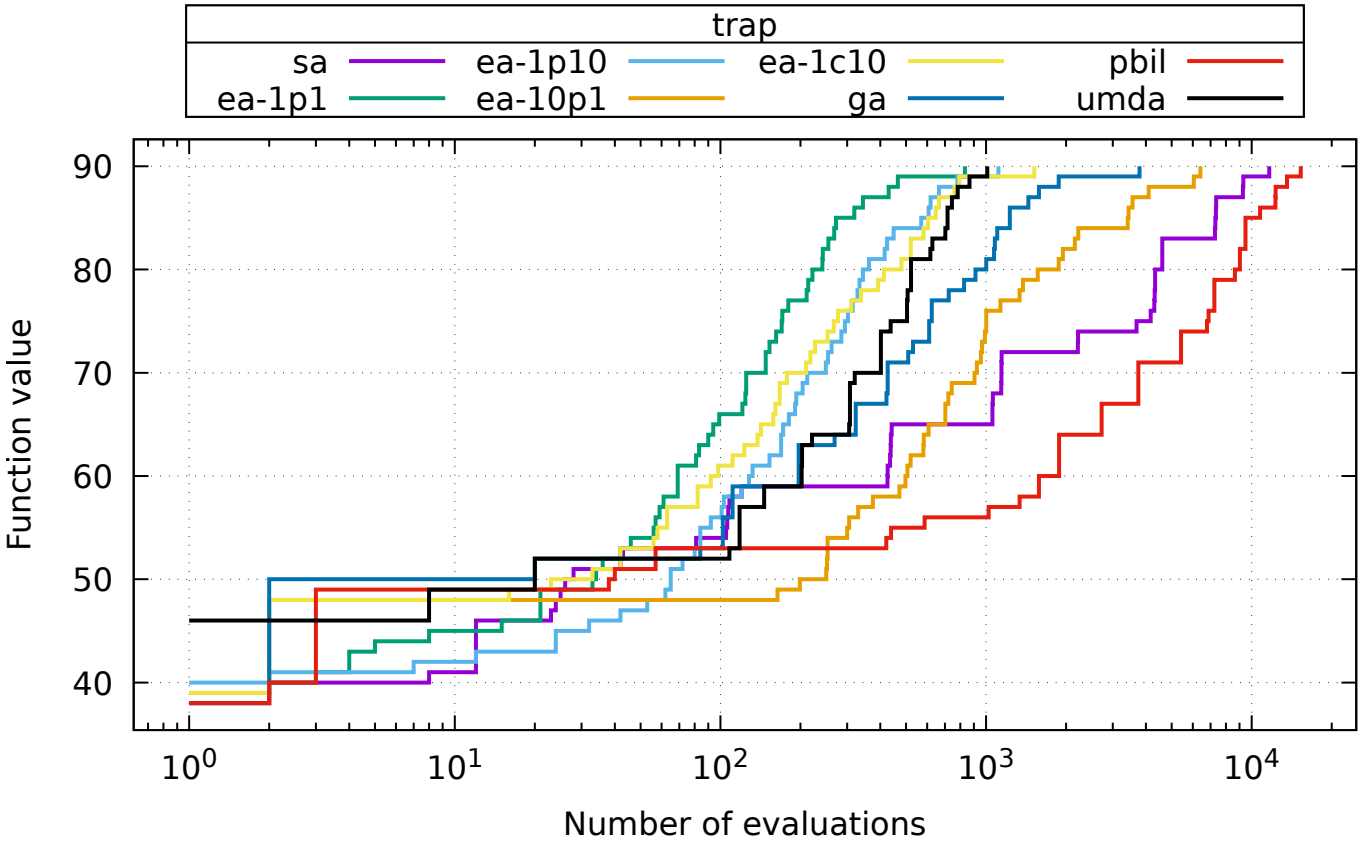
14 ep


ep
sa
ea-1p10
ea-1c10
pbil
ea-1p1
ea-10p1
ga
umda
Function value
Number of evaluations

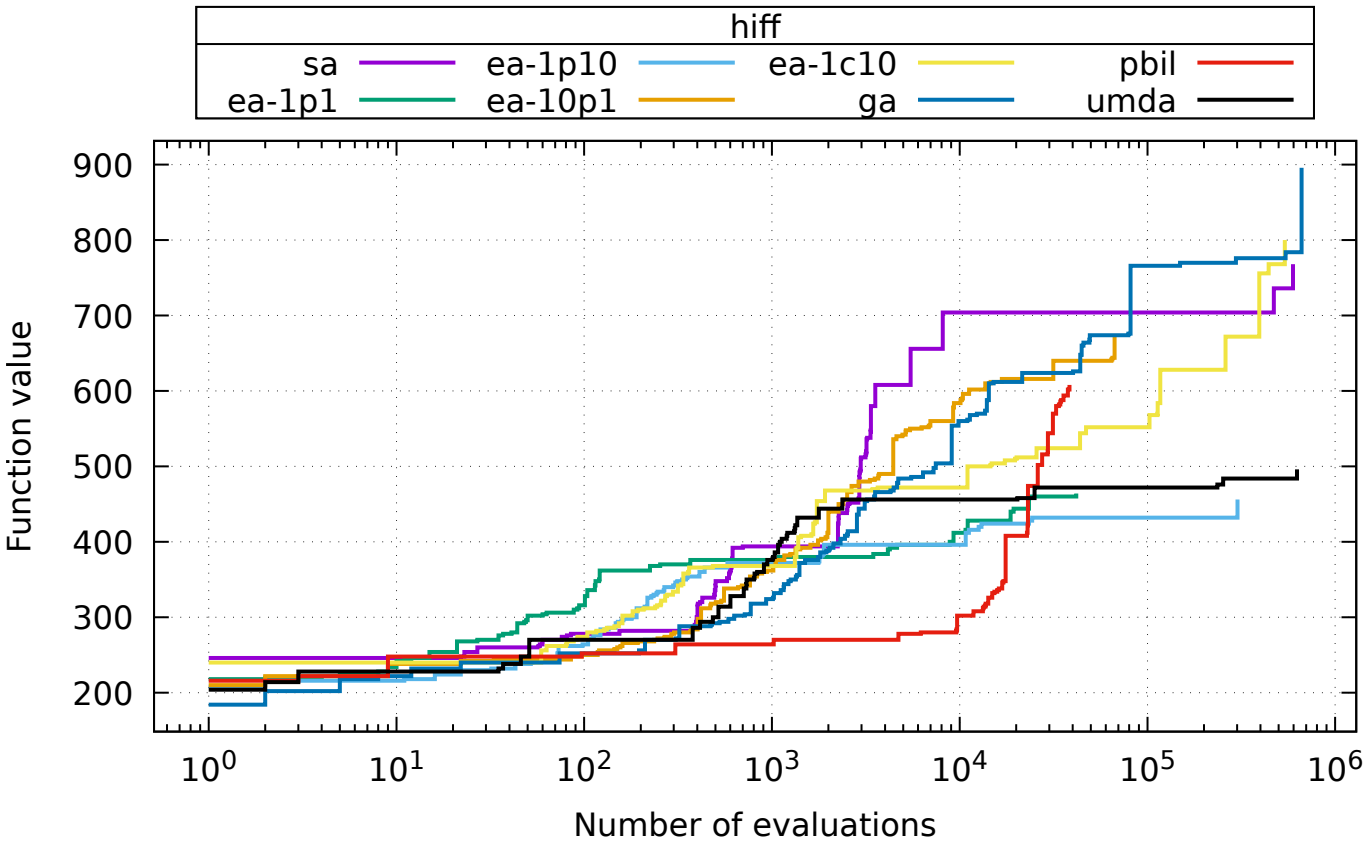
15 cancel



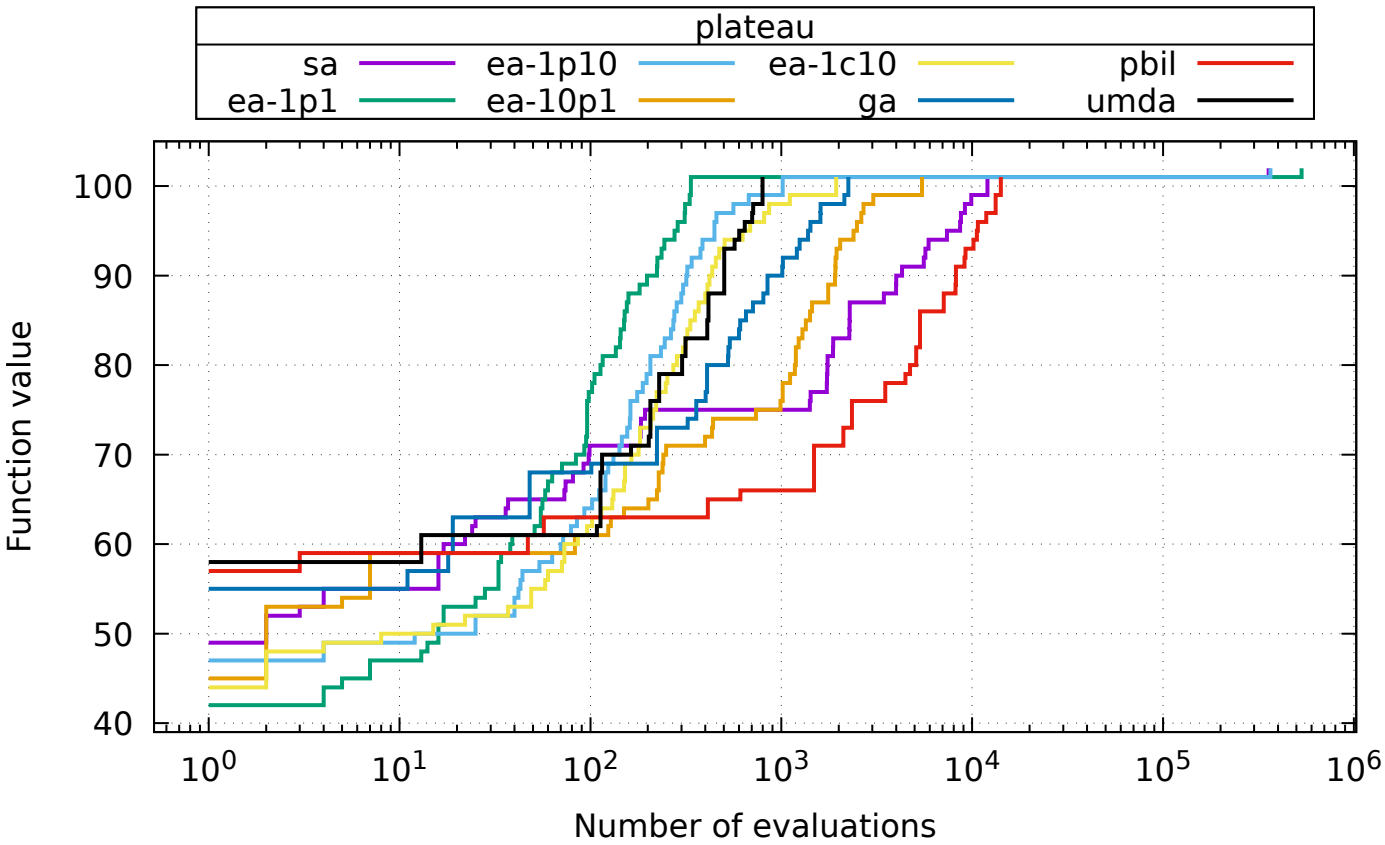
16 trap



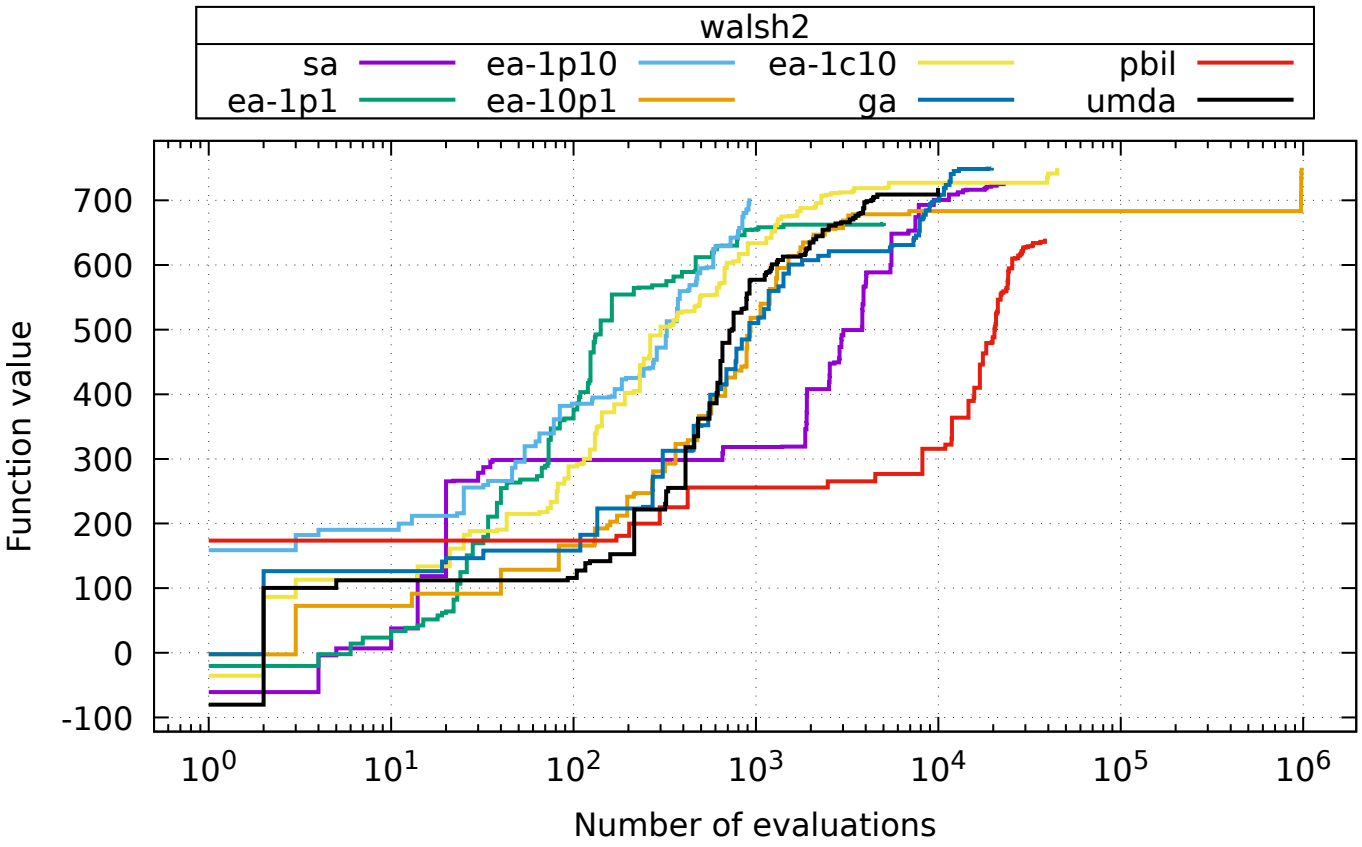
17 hiff



18 plateau



19 walsh2



A Plan

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        {
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            "opt": "-F 30 --stop-on-maximum -t 10"
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        "id": "plateau",
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    {
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        },
        {
            "id": "ea-1c10",
            "opt": "-A 320 --ea-mu 1 --ea-lambda 10 --allow-no-mutation"
        },
        {
            "id": "ga",
            "opt": "-A 400 --ea-mu 100"
        },
        {
            "id": "pbil",
            "opt": "-A 500 -l 5e-3"
        },
        {
            "id": "umda",
            "opt": "-A 600 -x 100 -y 10"
        }
    ]
}
```

B Default parameters

```
# algorithm = 100
# bm_mc_reset_strategy = 1
# bm_num_gs_cycles = 1
# bm_num_gs_steps = 100
# bm_sampling = 1
# budget = 10000
# bv_size = 100
# description_path = description.txt
# ea_lambda = 100
# ea_mu = 10
# expression = x
# fn_name = noname
# fn_num_traps = 10
# fn_prefix_length = 2
# fn_threshold = 10
# fp_expression = (1-x)^2+100*(y-x^2)^2
# fp_lower_bound = -2
# fp_num_bits = 8
# fp_upper_bound = 2
# function = 0
# ga_crossover_bias = 0.5
# ga_crossover_probability = 0.5
# ga_tournament_size = 10
# hea_bit_herding = 0
# hea_num_seq_updates = 100
# hea_reset_period = 0
# hea_sampling_method = 0
# hea_weight = 1
# learning_rate = 0.001
# map = 0
```

```
# map_input_size = 100
# map_path = map.txt
# map_ts_length = 10
# map_ts_sampling_mode = 0
# mutation_rate = 1
# neighborhood = 0
# neighborhood_iterator = 0
# noise_stddev = 1
# num_iterations = 0
# num_threads = 1
# path = function.txt
# pn_mutation_rate = 1
# pn_neighborhood = 0
# pn_radius = 2
# population_size = 10
# pv_log_num_components = 5
# radius = 2
# results_path = results.json
# rls_patience = 50
# sa_beta_ratio = 1.2
# sa_initial_acceptance_probability = 0.6
# sa_num_transitions = 50
# sa_num_trials = 100
# seed = 0
# selection_size = 1
# solution_path = solution.txt
# target = 100
# print_defaults
# last_parameter
# exec_name = hnco
# version = 0.15
# Generated from hnco.json
```