HNCO
Dynamics of performances
of various black box optimization algorithms

November 4, 2017

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1 Plan


```
{
    "exec": "hnco",
    "opt": "--log-improvement --map 1 --map-random -s 100 -i 0 -b 1000000",
    "parallel": true,
    "results": "results",
    "graphics": "graphics",
    "report": "report",
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            "opt": "-F 0 --stop-on-maximum",
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            "opt": "-F 1 -p instances/lin.100",
            "col": ">{{\\nprounddigits{2}}}N{2}{2}"
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        {
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            "opt": "-F 10 --stop-on-maximum",
            "col": ">{{\\nprounddigits{0}}}N{3}{0}"
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        {
            "id": "ridge",
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            "col": ">{{\\nprounddigits{0}}}N{3}{0}"
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        },
        {
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        },
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        },
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            "opt": "-F 40 --stop-on-maximum -t 5",
            "col": ">{{\\nprounddigits{0}}}N{3}{0}"
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            "col": ">{{\\nprounddigits{0}}}N{3}{0}"
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        {
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            "opt": "-F 60 -p instances/nk.100.4",
```

```
            "col": ">{{\\nprounddigits{2}}}N{1}{2}"
        },
        {
            "id": "max-sat",
            "opt": "-F 70 -p instances/ms.100.3.1000 --cache",
            "col": ">{{\\nprounddigits{0}}}N{3}{0}"
        },
        {
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            "opt": "-F 80",
            "col": ">{{\\nprounddigits{2}}}N{1}{2}"
        },
        {
            "id": "ep",
            "opt": "-F 90 -p instances/ep.100",
            "reverse": true,
            "logscale": true,
            "col": ">{{\\nprounddigits{2}}}N{1}{2}"
        },
        {
            "id": "cancel",
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            "reverse": true,
            "col": ">{{\\nprounddigits{2}}}N{1}{2}"
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        },
        {
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            "opt": "-A 300"
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        {
            "id": "ea-1p10",
            "opt": "-A 310 --ea-mu 1 --ea-lambda 10"
        },
        {
            "id": "ea-10p1",
            "opt": "-A 310 --ea-mu 10 --ea-lambda 1"
        },
```

```
        {
            "id": "ea-1c10",
            "opt": "-A 320 --ea-mu 1 --ea-lambda 10"
        },
        {
            "id": "ga",
            "opt": "-A 400 --ea-mu 100"
        },
        {
            "id": "pbil",
            "opt": "-A 500 -r 5e-3"
        },
        {
            "id": "umda",
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        }
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}
```
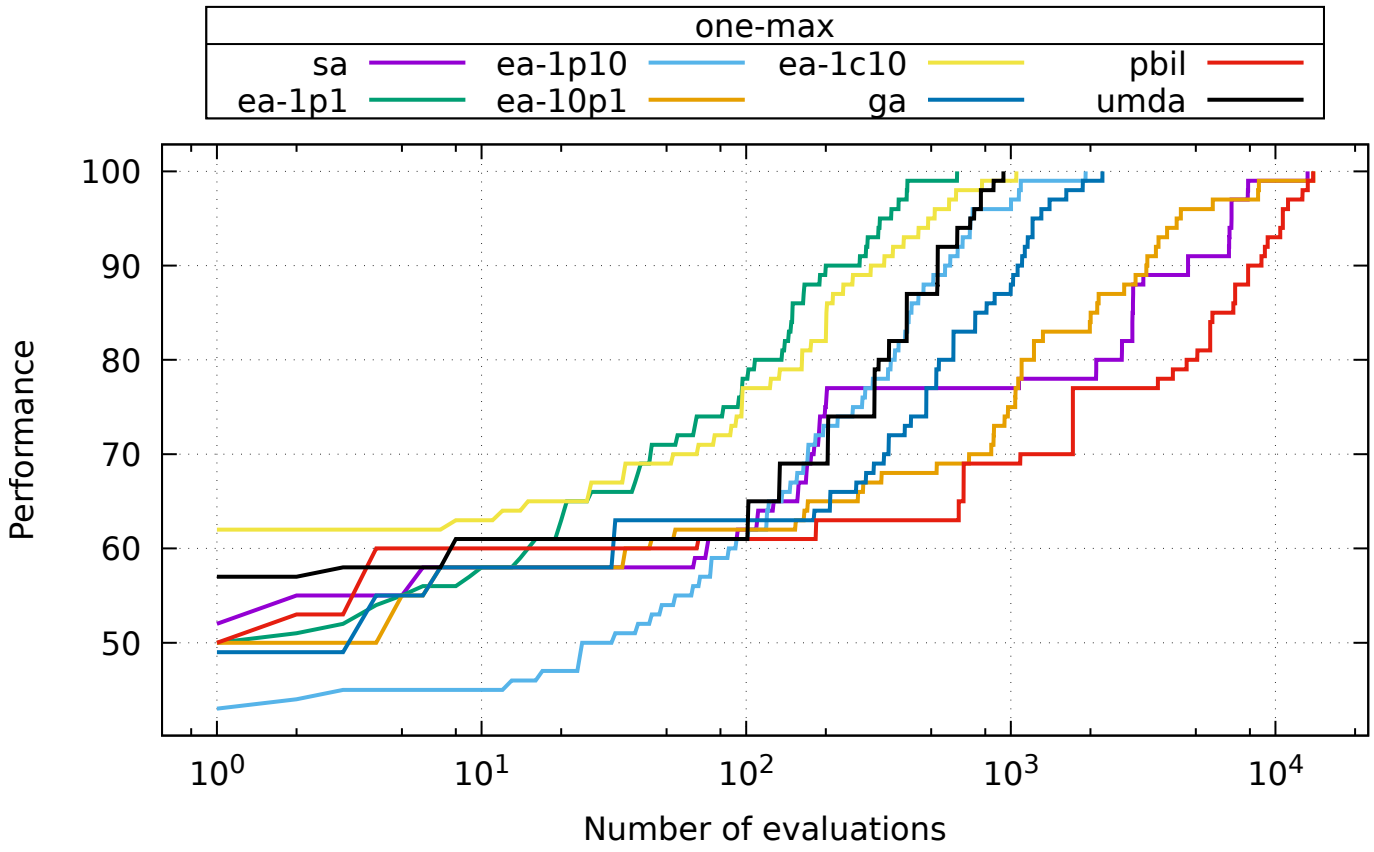
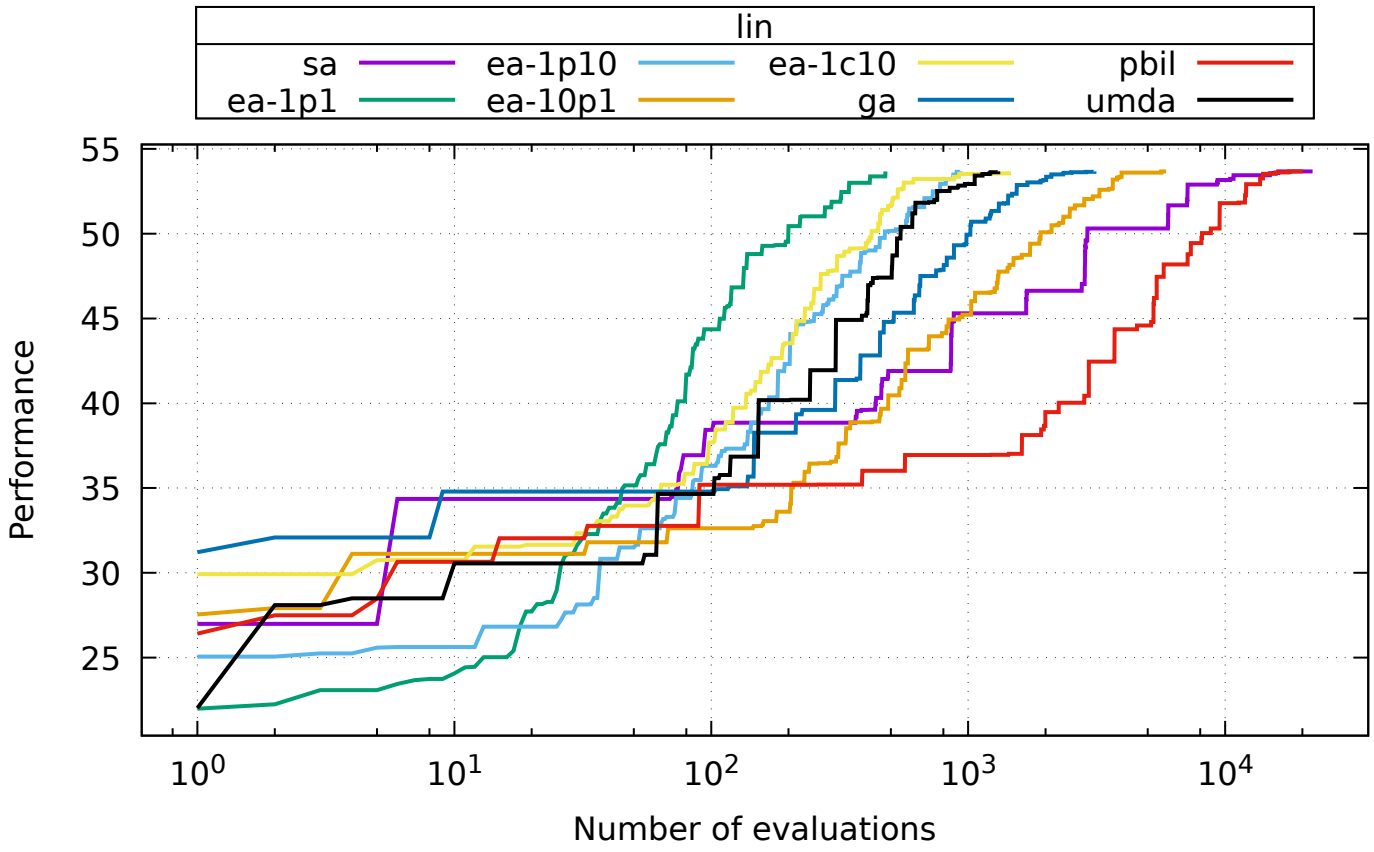
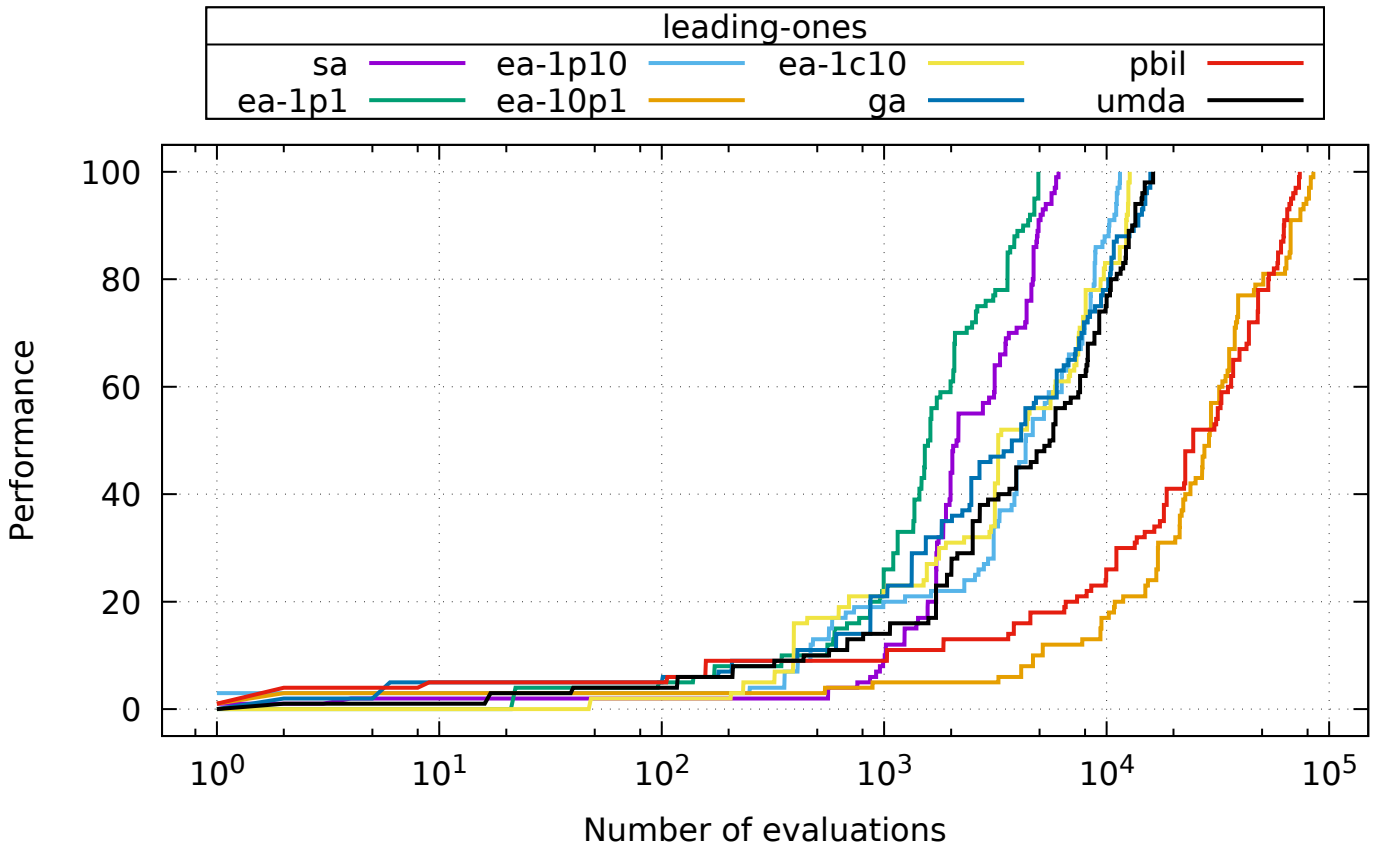

2 one-max



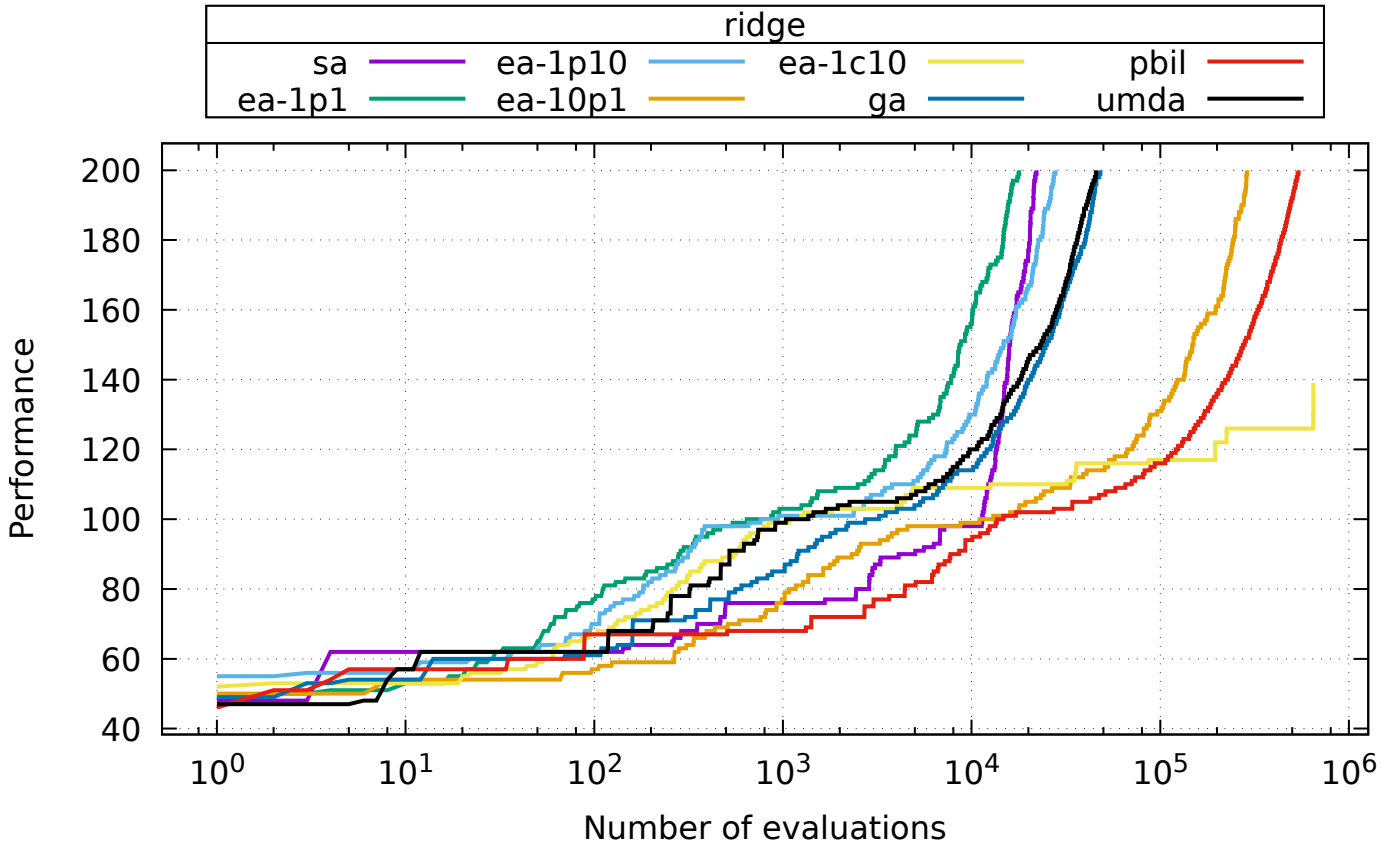
3 lin



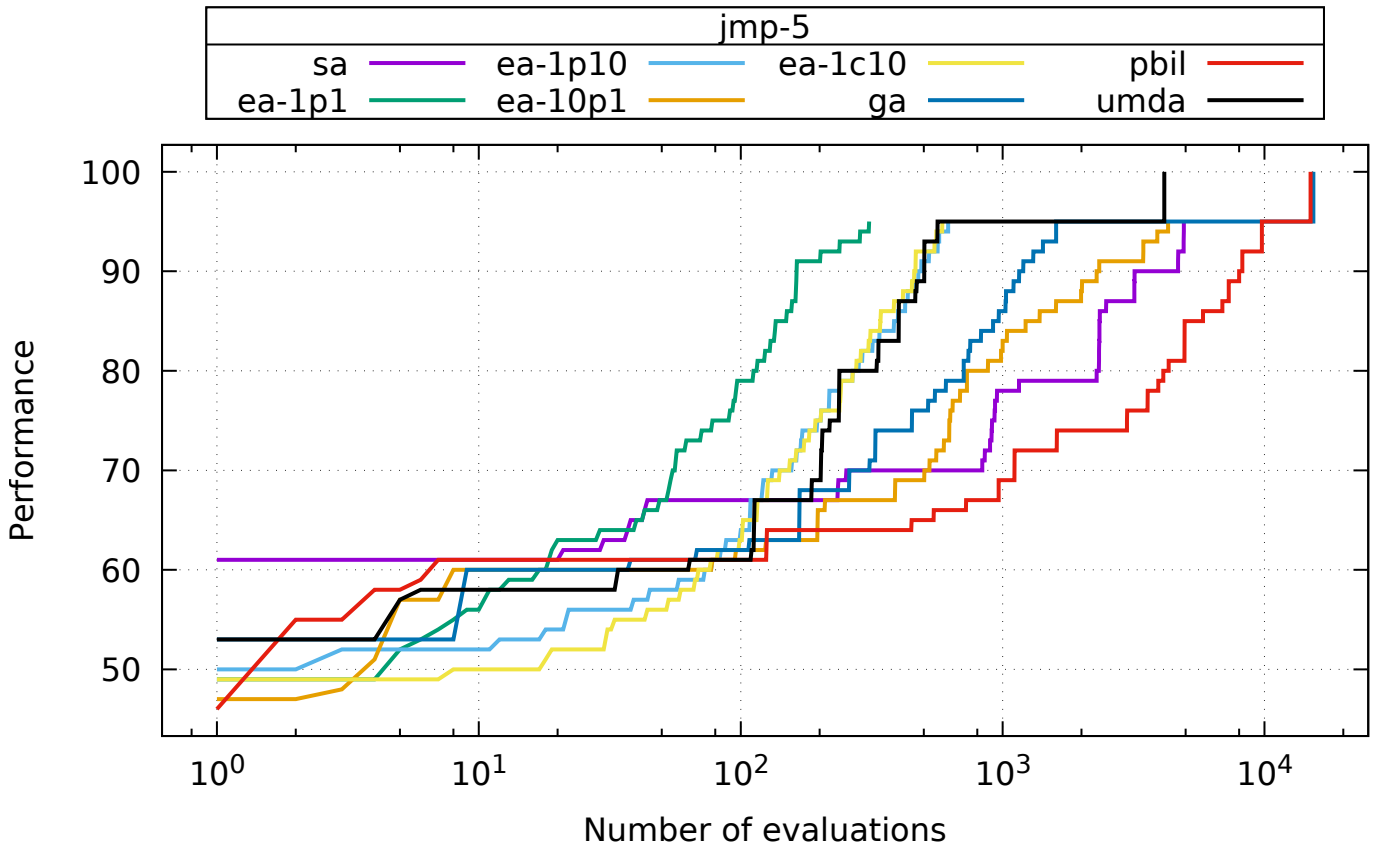
4 leading-ones



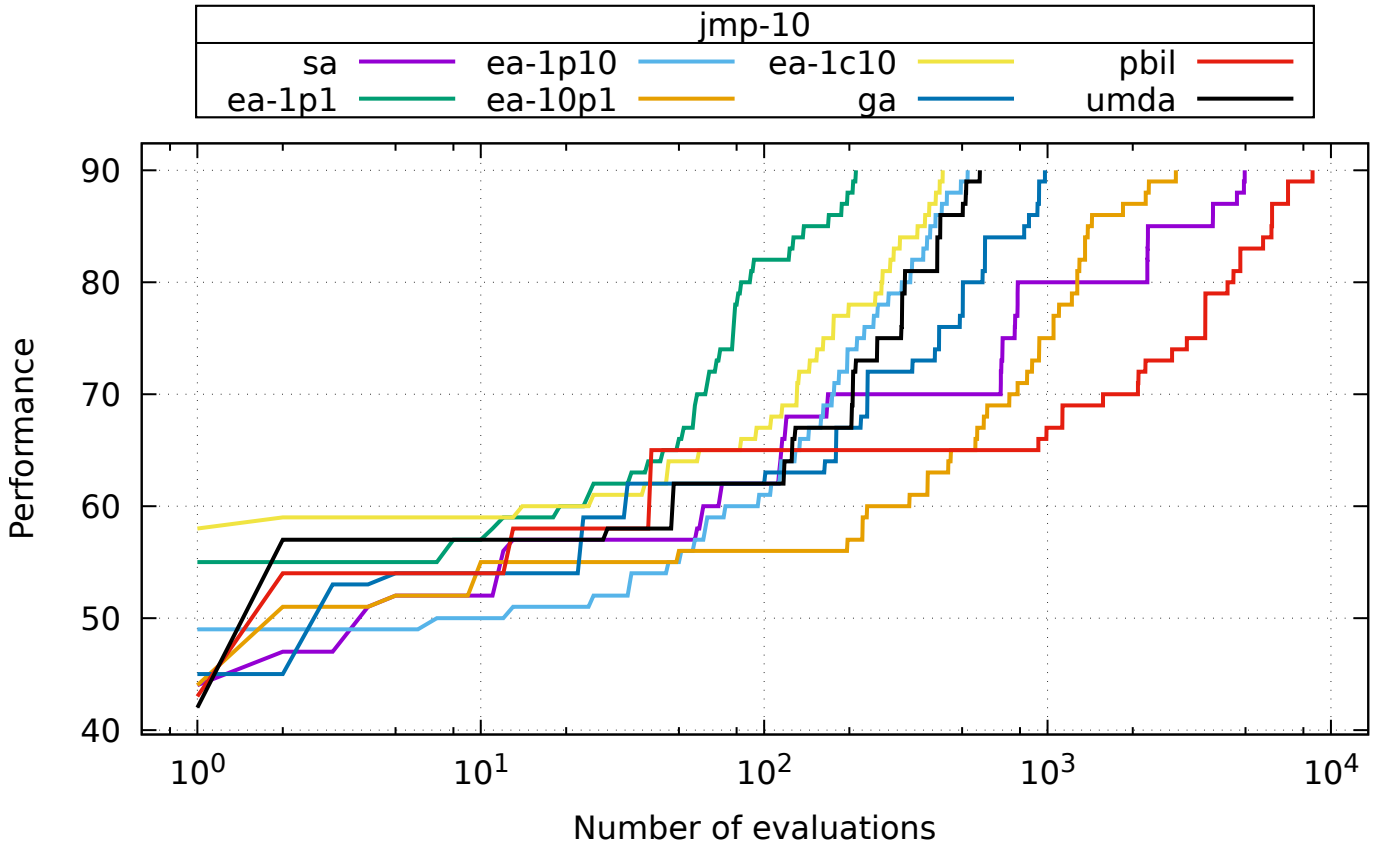
5 ridge



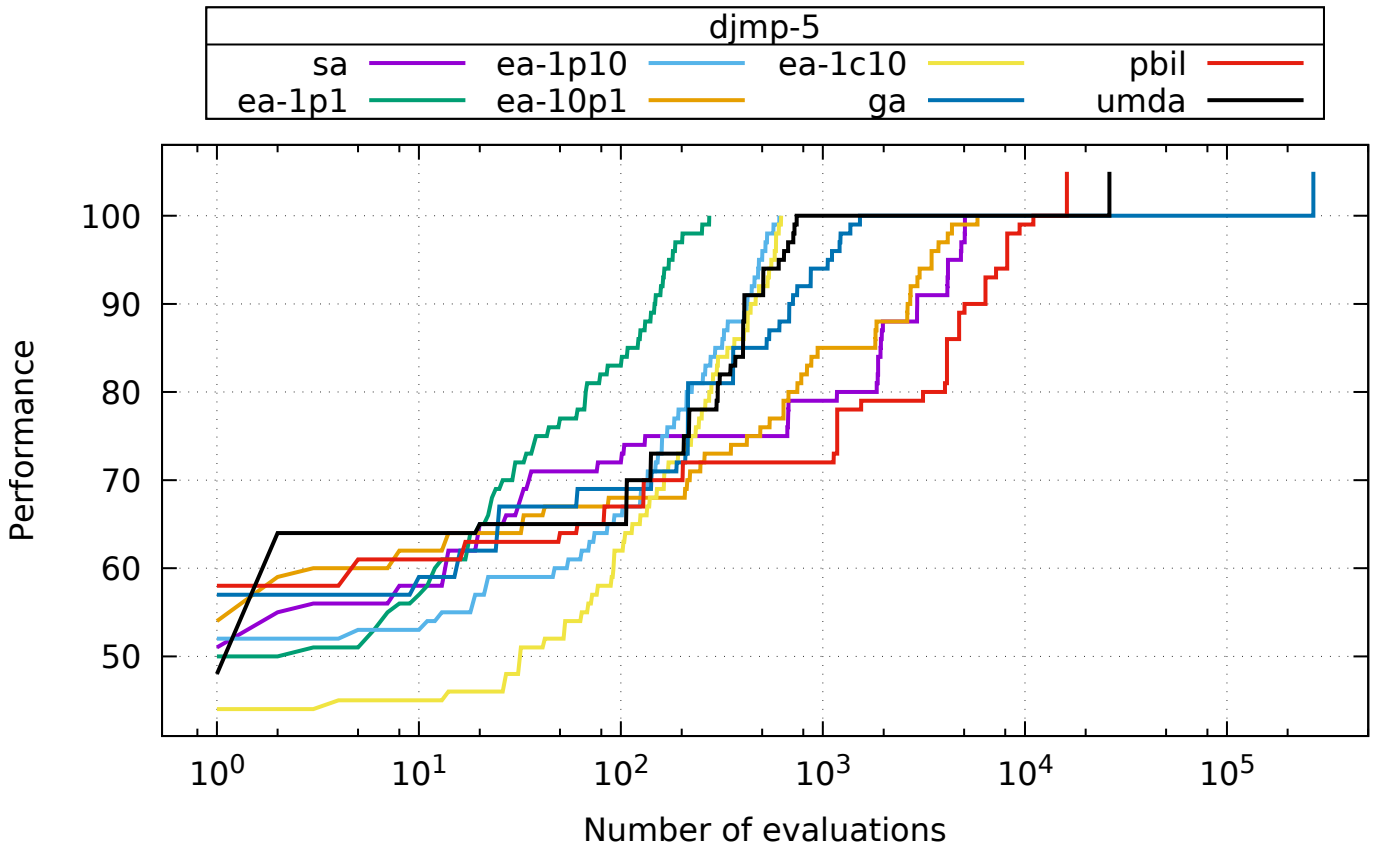
6 jmp-5



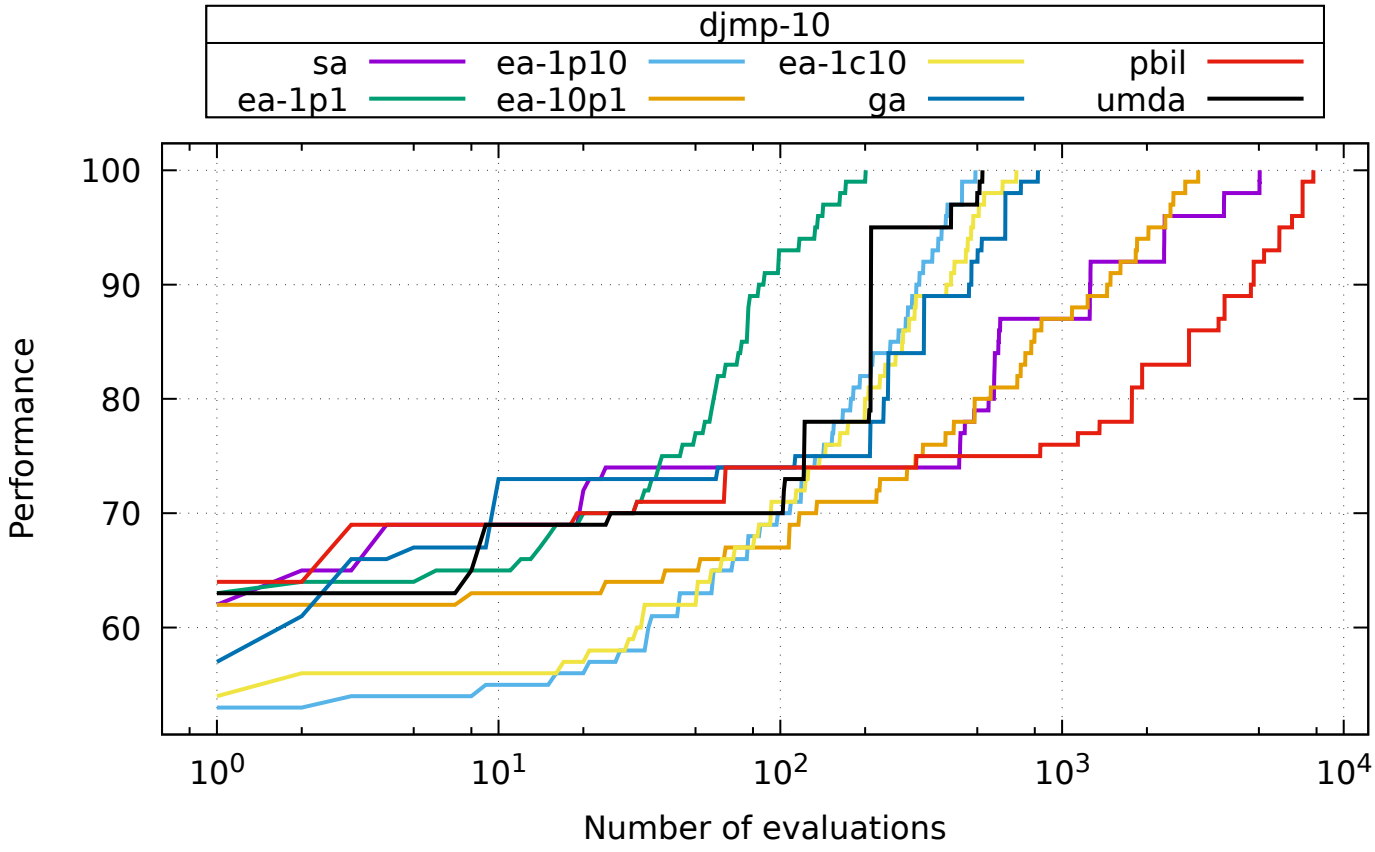
7 jmp-10



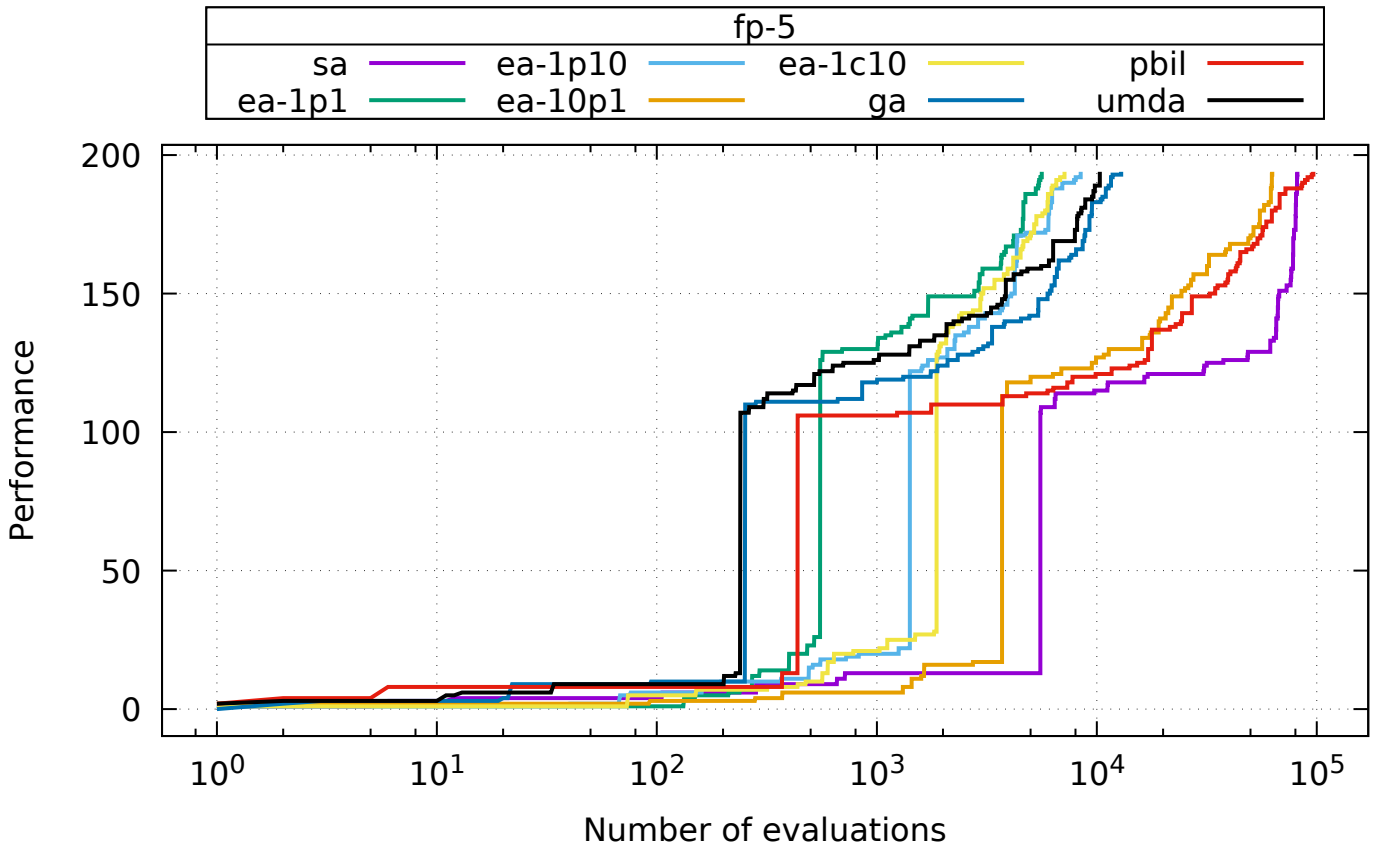
8 djmp-5



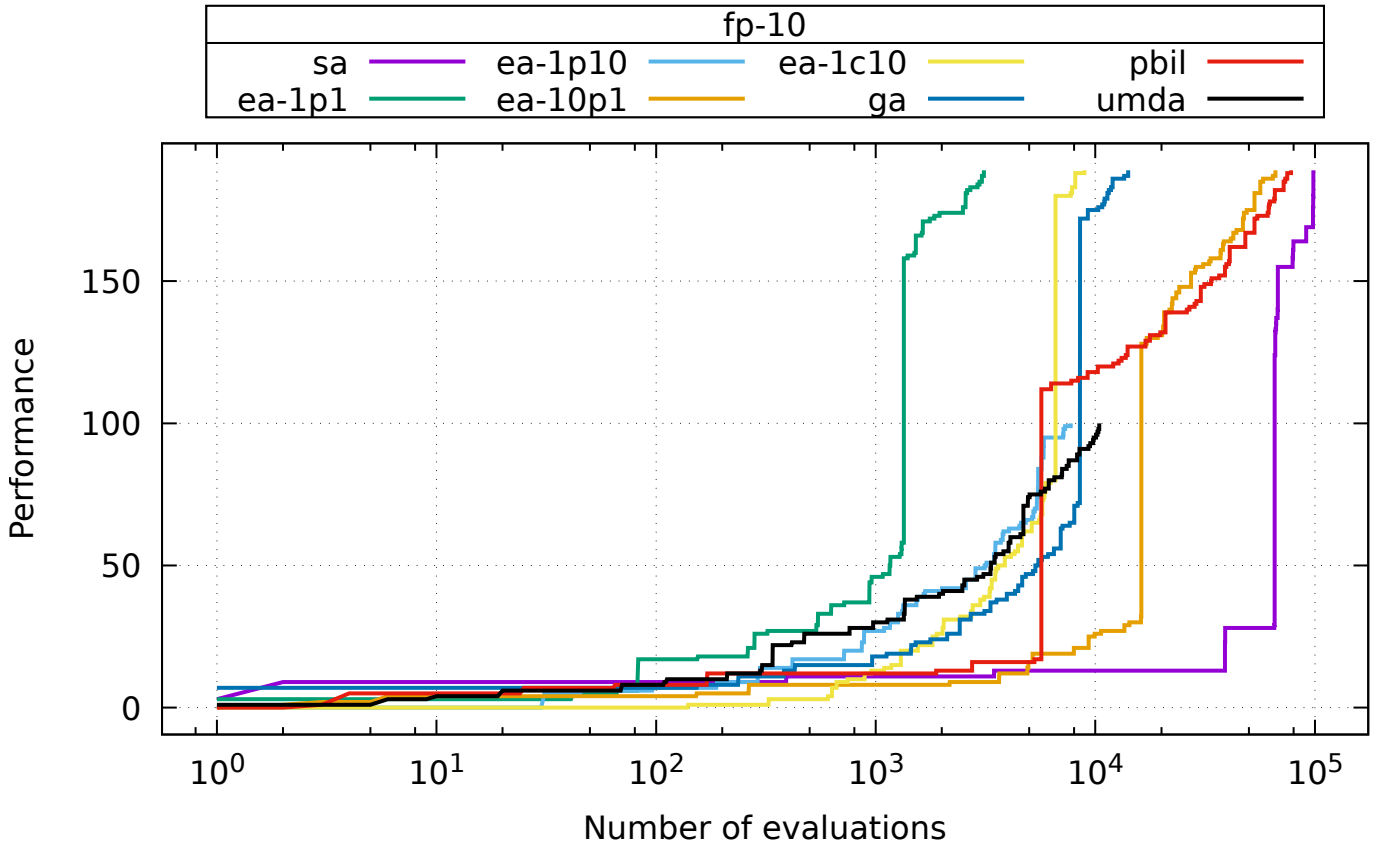
9 djmp-10



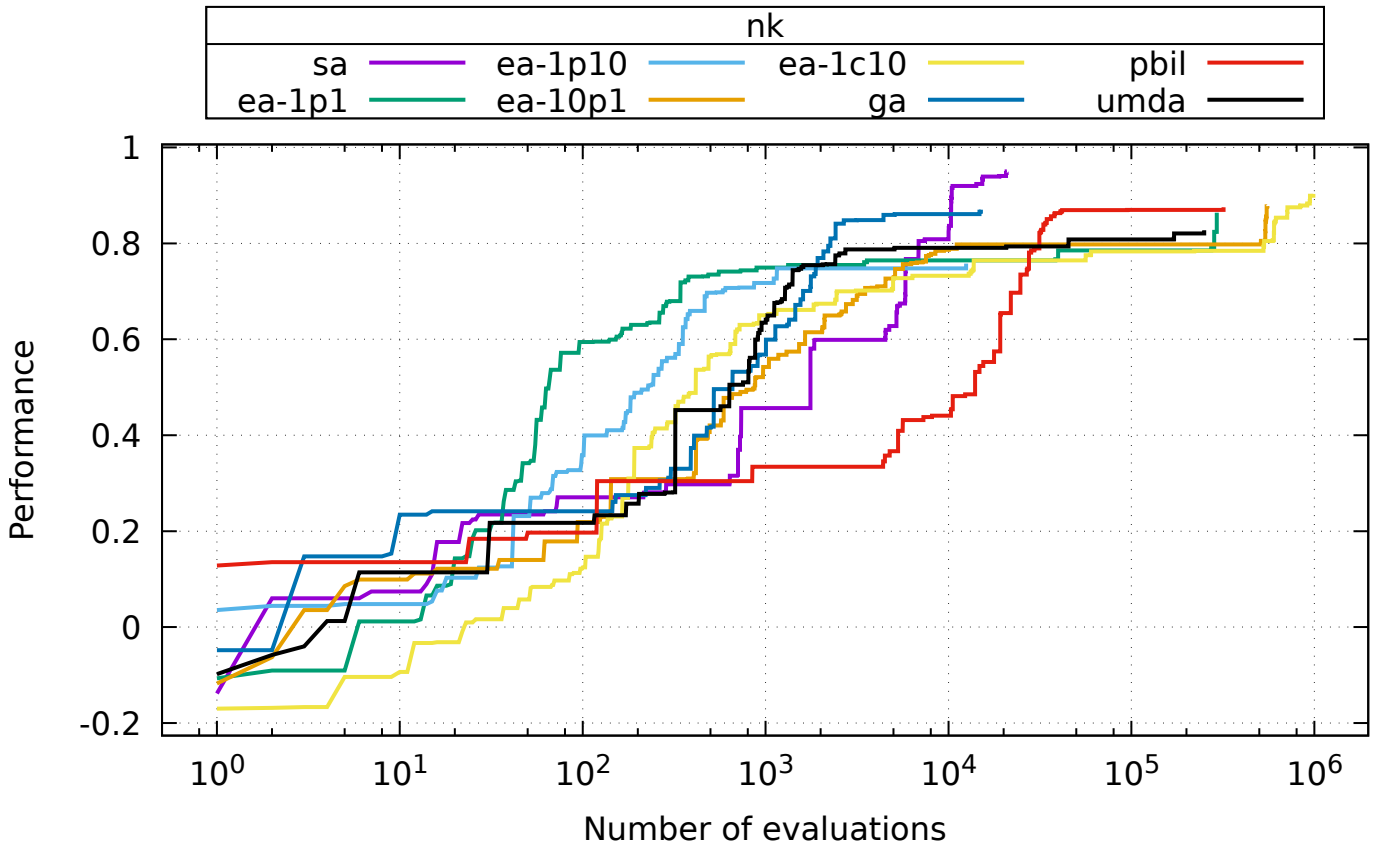
10 fp-5



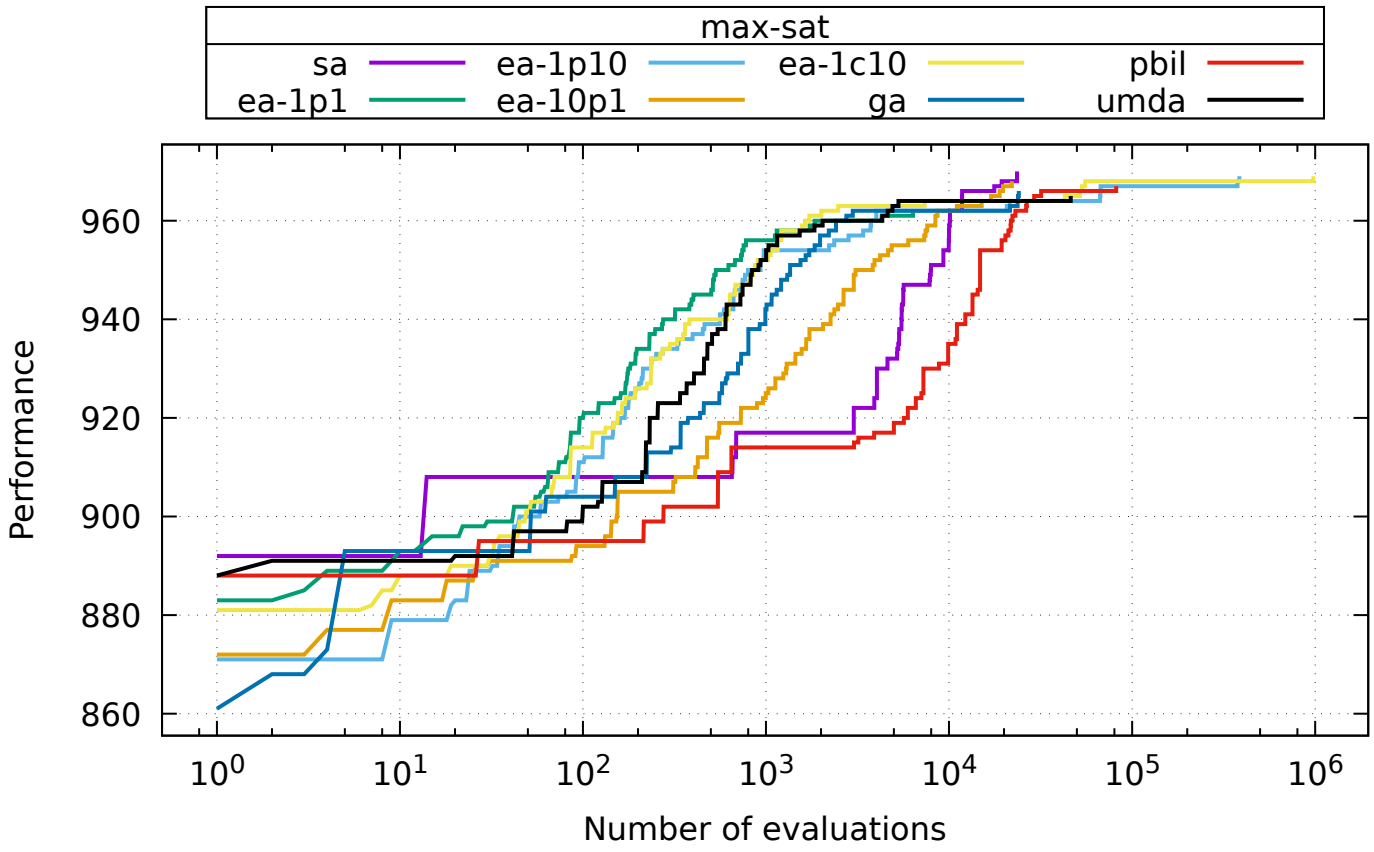
11 fp-10



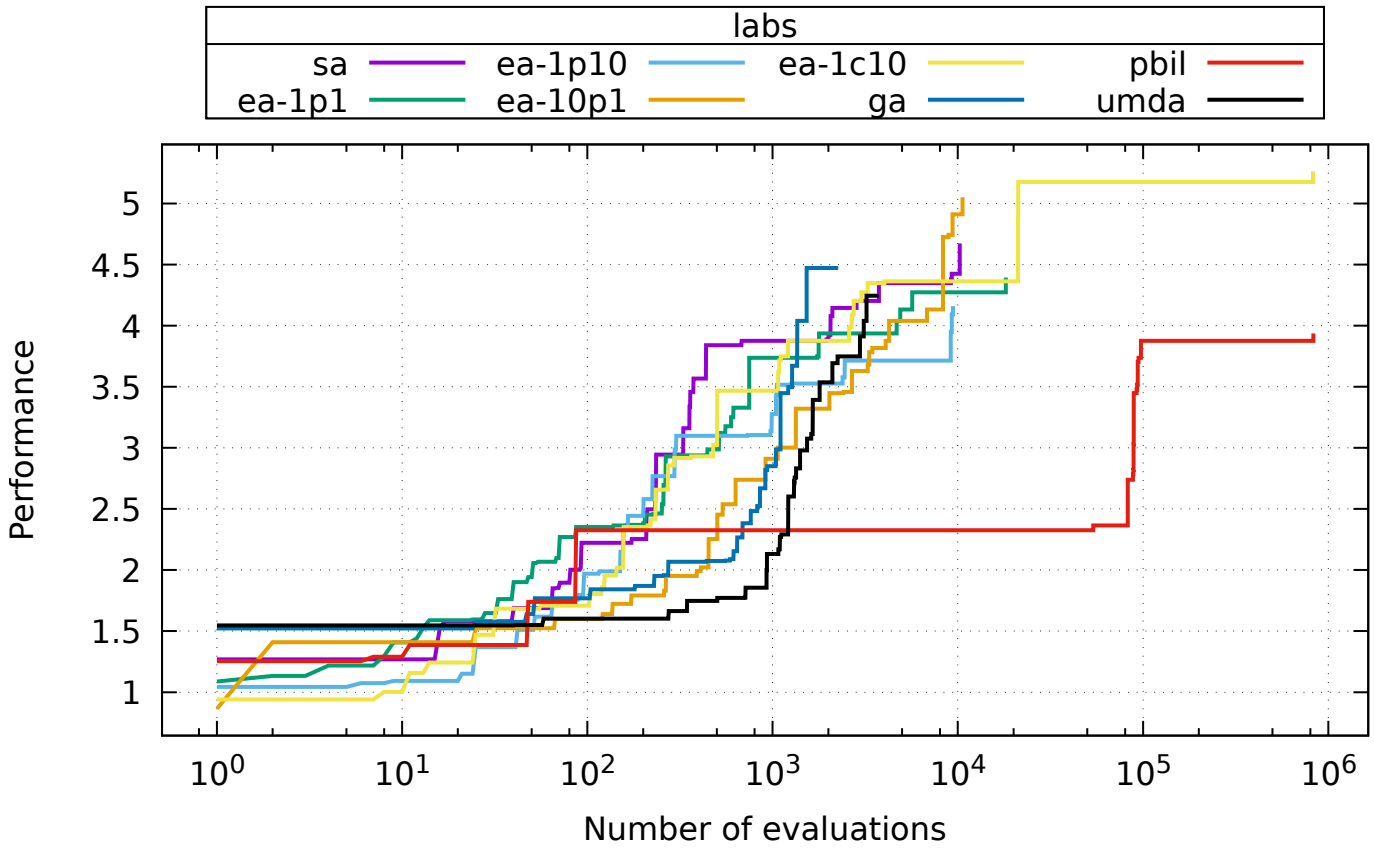
12 nk



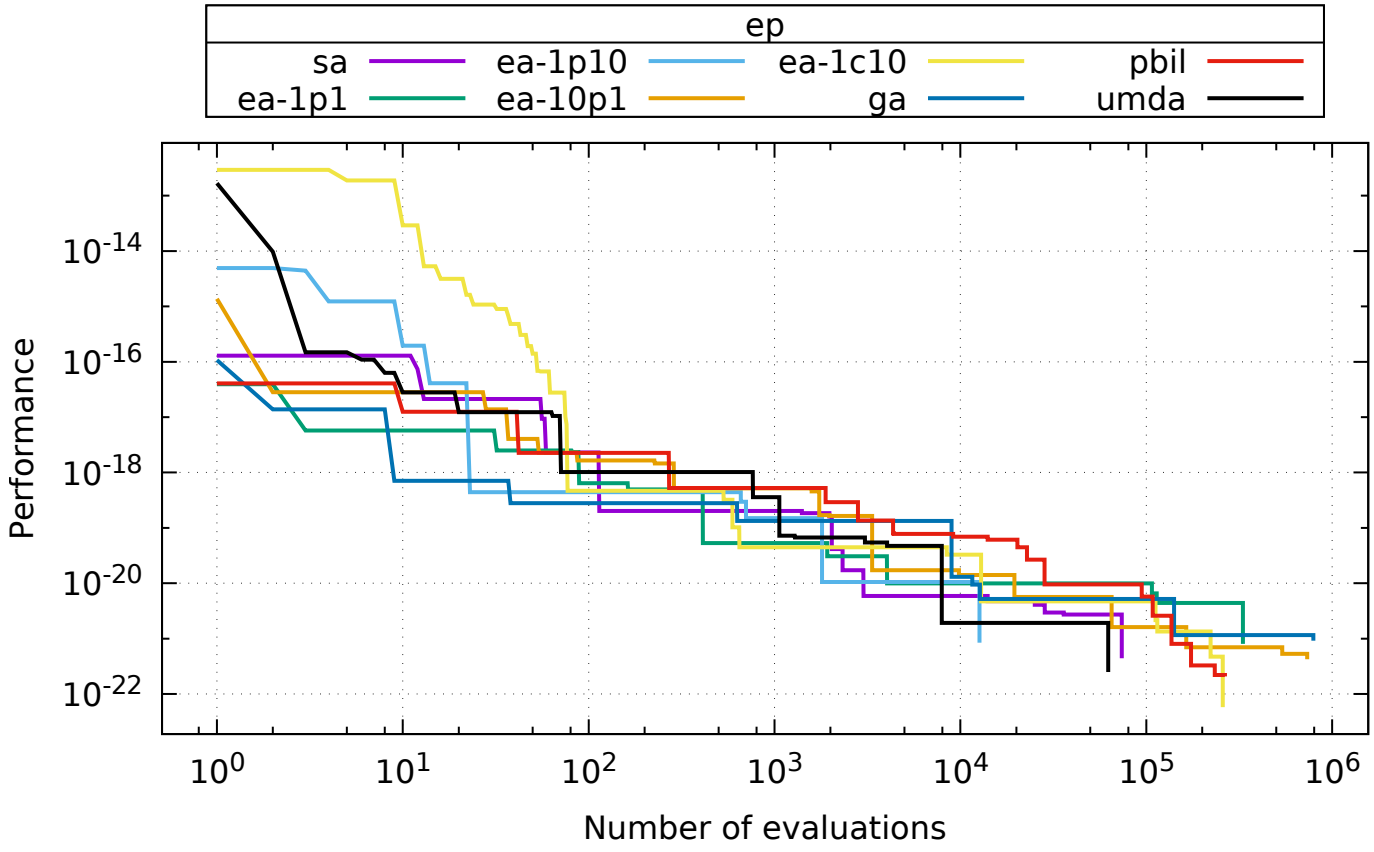
13 max-sat



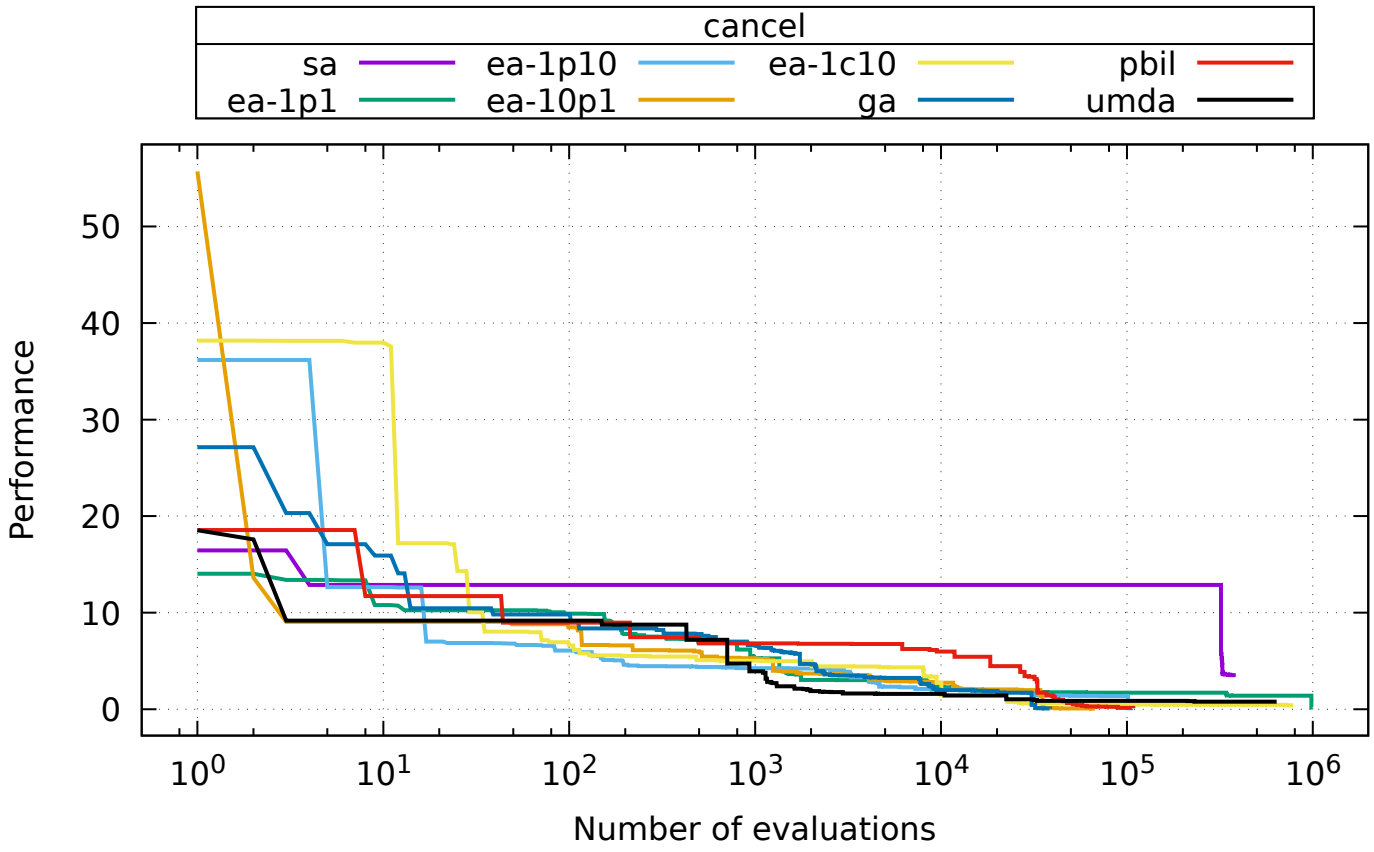
14 labs


labs
sa
ea-1p10
ea-1c10
pbil
ea-1p1
ea-10p1
ga
umda
Performance
5
4.5
4
3.5
3
2.5
2
1.5
1
10^0
10^1
10^2
10^3
10^4
10^5
10^6
Number of evaluations

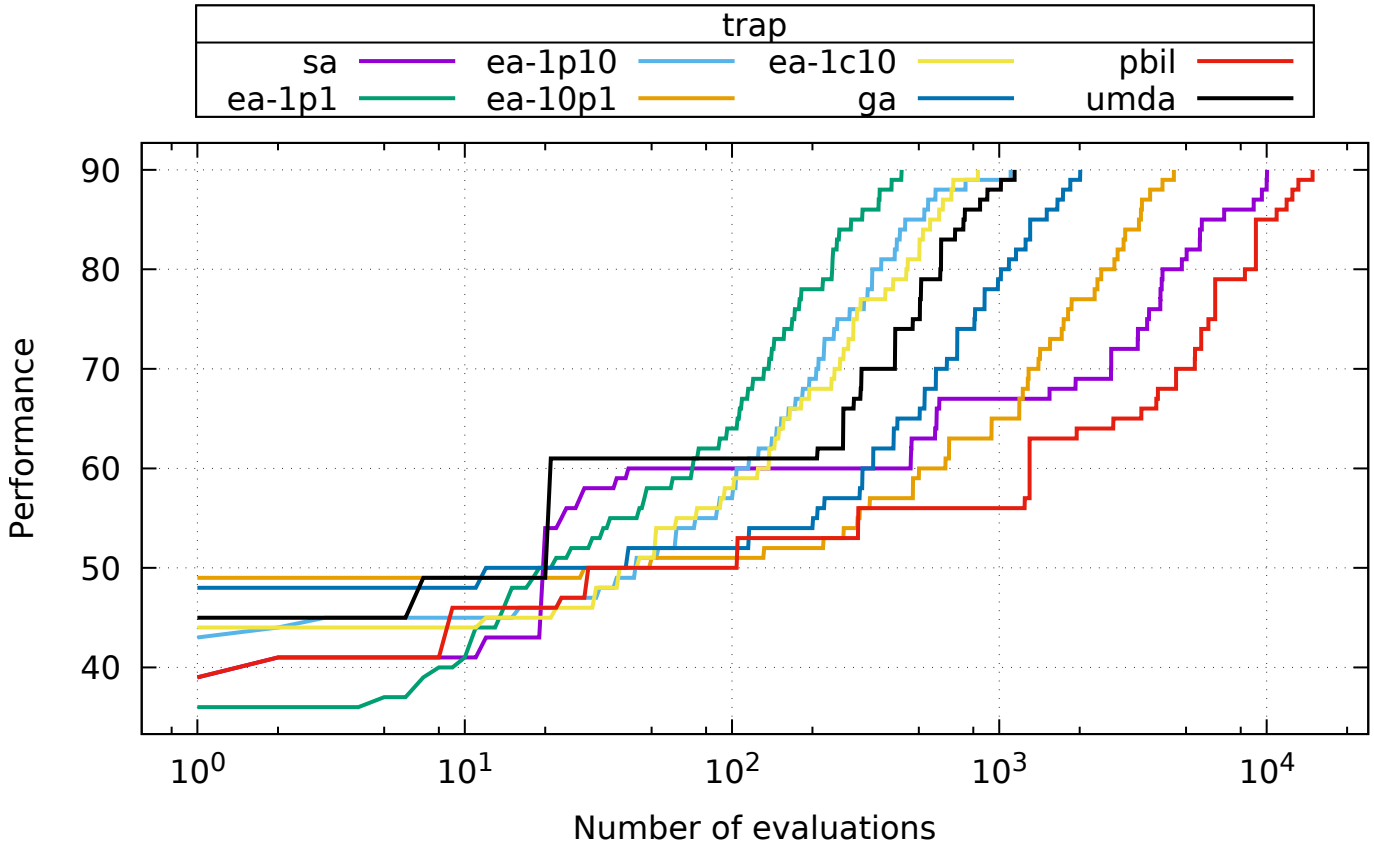
15 ep


ep
sa
ea-1p10
ea-1c10
pbil
ea-1p1
ea-10p1
ga
umda
Performance
10^{-14}
10^{-16}
10^{-18}
10^{-20}
10^{-22}
10^0
10^1
10^2
10^3
10^4
10^5
10^6
Number of evaluations

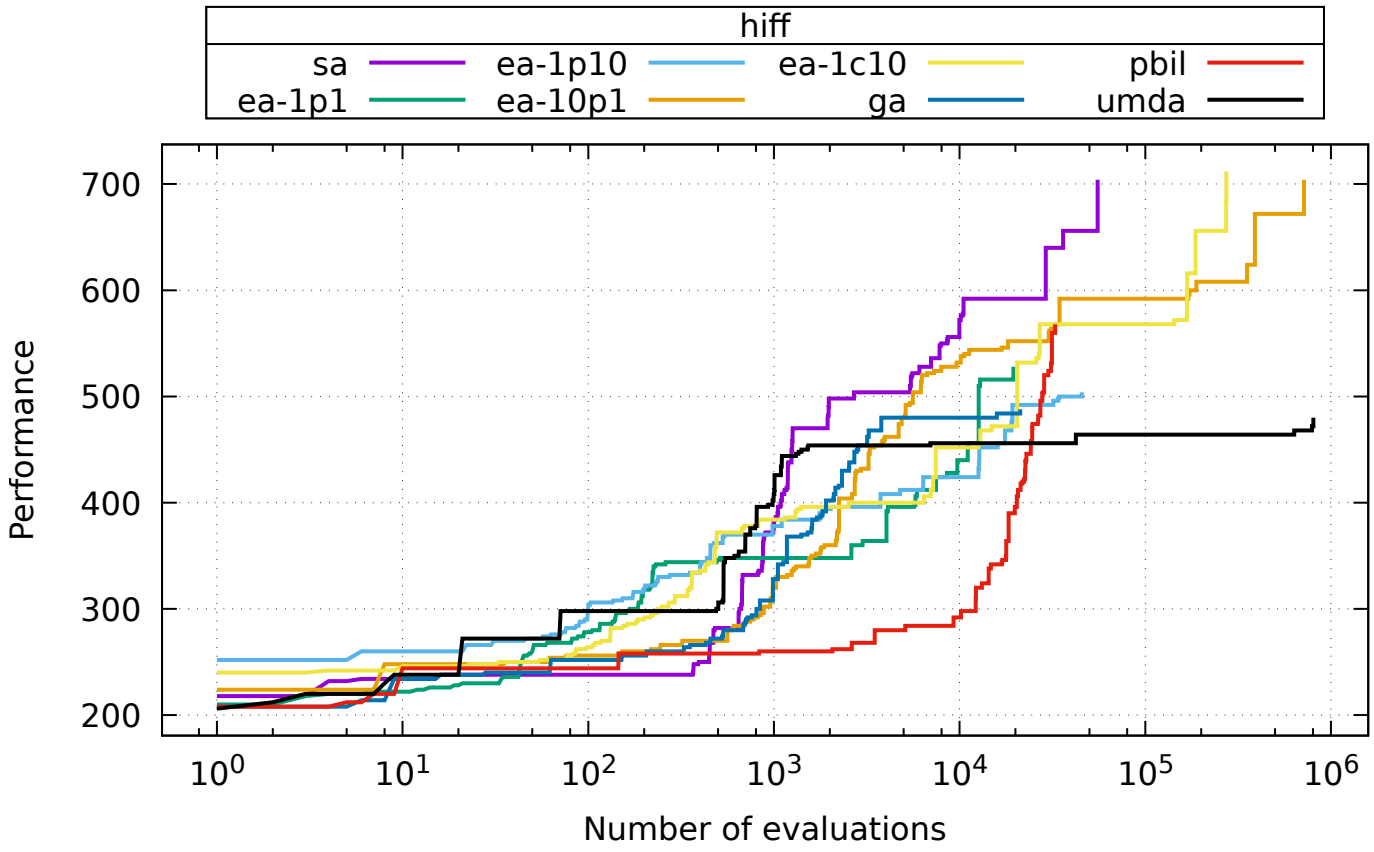
16 cancel



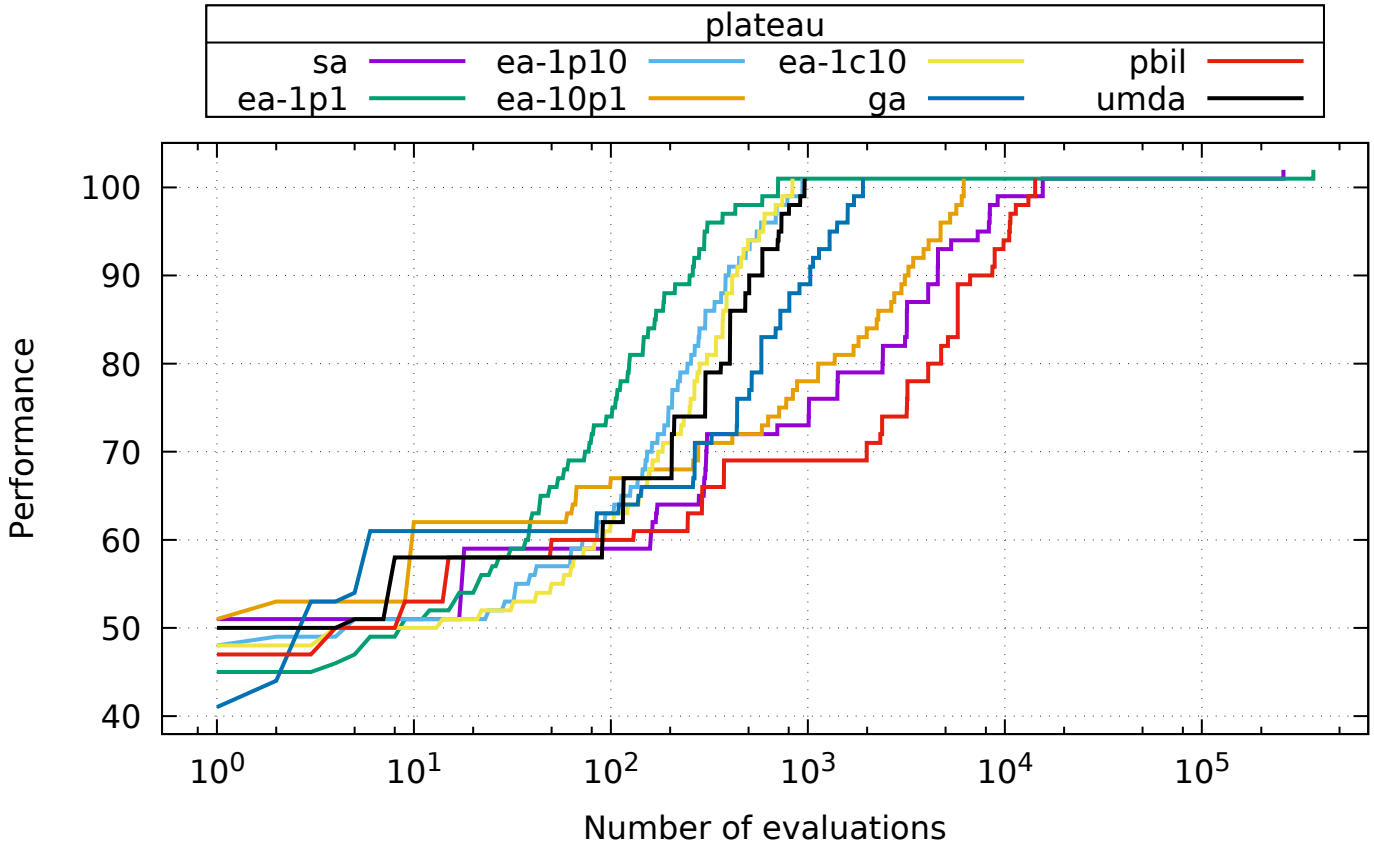
17 trap



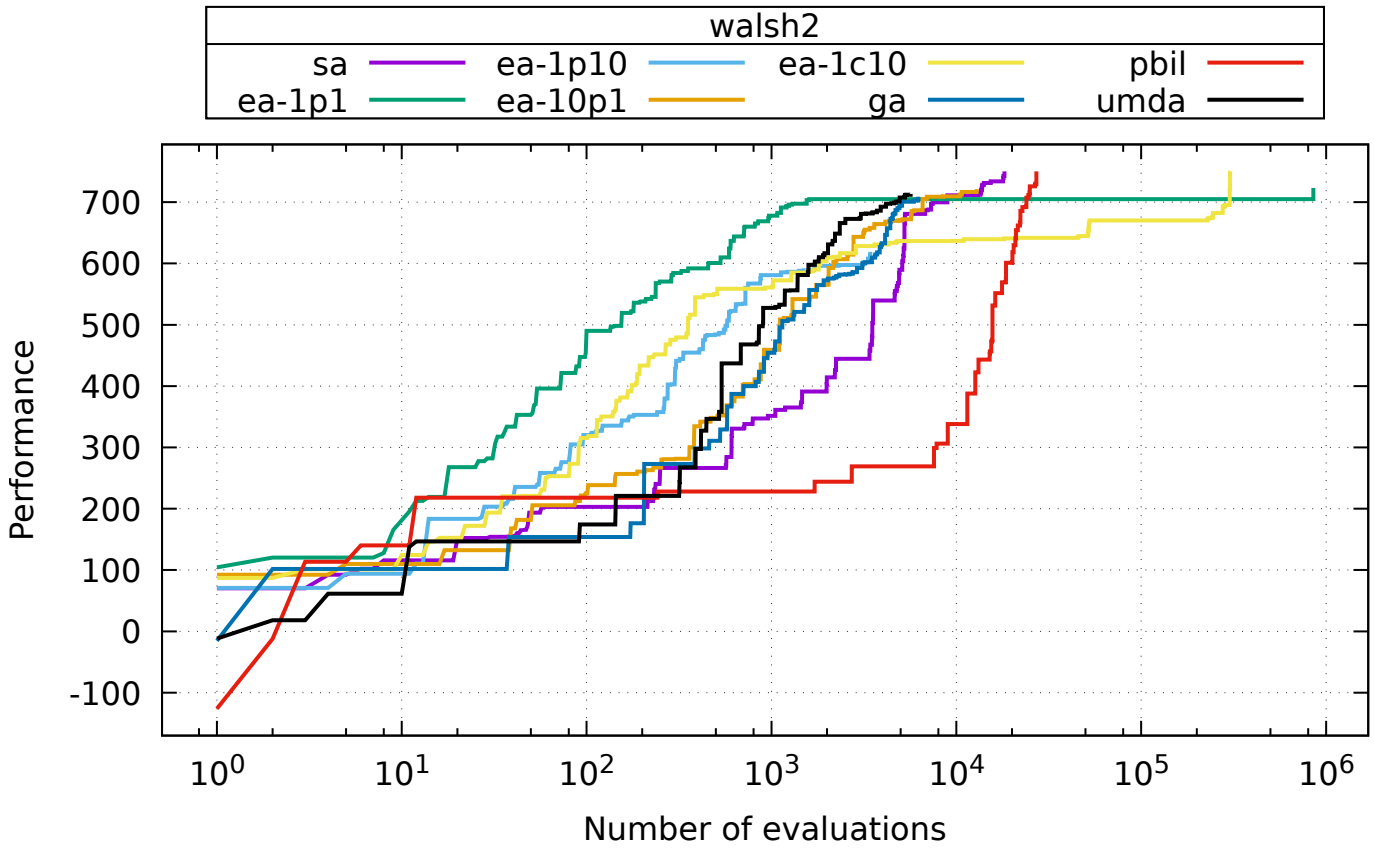
18 hiff



19 plateau



20 walsh2


walsh2
sa
ea-1p10
ea-1c10
pbil
ea-1p1
ea-10p1
ga
umda
Performance
700
600
500
400
300
200
100
0
-100
10^0
10^1
10^2
10^3
10^4
10^5
10^6
Number of evaluations

21 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
# ea_lambda = 100
# ea_mu = 10
# fun_name = noname
# fun_num_traps = 10
# fun_prefix_length = 2
# fun_threshold = 10
# function = 0
# ga_crossover_probability = 0.5
# ga_tournament_size = 10
# hea_binary_dynamics = 0
# hea_delay = 10000
# hea_num_par_updates = 1
# hea_num_seq_updates = 100
# hea_rate_strategy = 0
# hea_reset_period = 0
# hea_sampling_method = 0
# hea_time_constant = 1000
# hea_weight = 1
# learning_rate = 0.001
# map = 0
# map_input_size = 100
# map_path = nopath
# neighborhood = 0
# neighborhood_iterator = 0
# noise_stddev = 1
# num_iterations = 0
# num_threads = 1
# path = nopath
# population_size = 10
# pv_log_num_components = 5
# radius = 2
# rls_patience = 50
# sa_initial_acceptance_probability = 0.6
# sa_num_transitions = 50
# sa_num_trials = 100
# sa_rate = 1.2
# scaled_mutation_probability = 1
# seed = 0
# selection_size = 1
# target = 100
# print_default_parameters
# last_parameter
# exec_name = hnco
# version = 0.7
# Generated from hnco.json
```