HNCO
Dynamics of performances
of various black box optimization algorithms

April 25, 2017

Contents

1 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
# exhaustive_neighborhood = 0
# fun_num_traps = 10
# 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
# noise_stddev = 1
# num_iterations = 0
# path = nopath
# patience = 50
# plugin_function_name = nofunction
# population_size = 10
# pv_log_num_components = 5
# radius = 2
# 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
# print_default_parameters
# last_parameter
# exec_name = hnco
# version = 1.13
# Generated from hnco.json
```

2 Plan

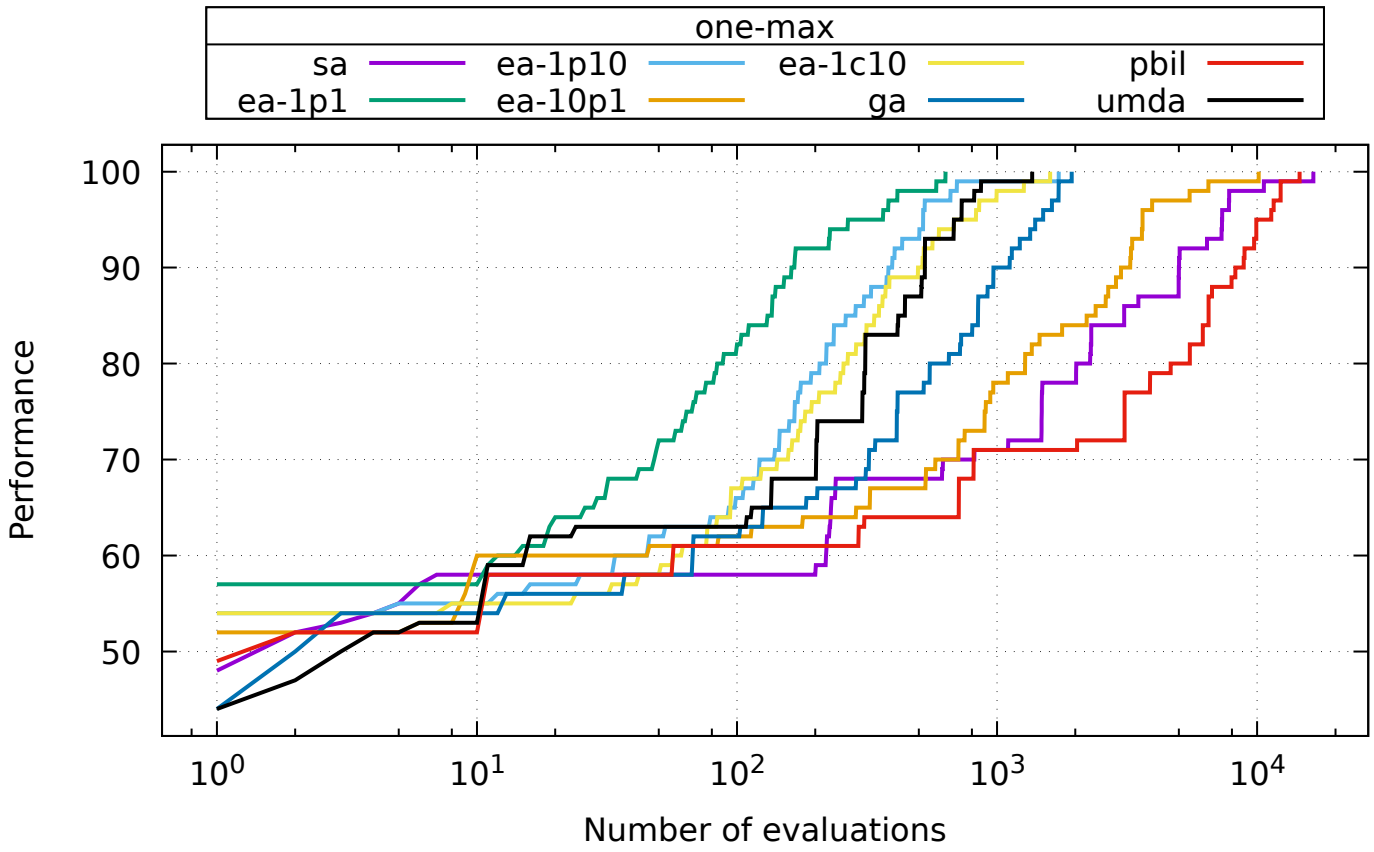
```
{
    "exec": "hnco",
    "opt": "--no-header --log-improvement --map 1 --map-random -s 100 -i 0 -b 1000000",
    "results": "results",
    "graphics": "graphics",
    "report": "report",
    "functions": [
        {
            "id": "one-max",
```

```
    "opt": "-F 0",
    "col": ">{{\\nprounddigits{0}}}N{3}{0}"
},
{
    "id": "lin",
    "opt": "-F 1 -p instances/lin.100",
    "col": ">{{\\nprounddigits{2}}}N{2}{2}"
},
{
    "id": "leading-ones",
    "opt": "-F 10",
    "col": ">{{\\nprounddigits{0}}}N{3}{0}"
},
{
    "id": "ridge",
    "opt": "-F 11",
    "col": ">{{\\nprounddigits{0}}}N{3}{0}"
},
{
    "id": "jmp-5",
    "opt": "-F 30 -t 5",
    "col": ">{{\\nprounddigits{0}}}N{3}{0}"
},
{
    "id": "jmp-10",
    "opt": "-F 30 -t 10",
    "col": ">{{\\nprounddigits{0}}}N{3}{0}"
},
{
    "id": "djmp-5",
    "opt": "-F 31 -t 5",
    "col": ">{{\\nprounddigits{0}}}N{3}{0}"
},
{
    "id": "djmp-10",
    "opt": "-F 31 -t 10",
    "col": ">{{\\nprounddigits{0}}}N{3}{0}"
},
{
    "id": "fp-5",
    "opt": "-F 40 -t 5",
    "col": ">{{\\nprounddigits{0}}}N{3}{0}"
},
{
    "id": "fp-10",
    "opt": "-F 40 -t 10",
    "col": ">{{\\nprounddigits{0}}}N{3}{0}"
},
{
    "id": "quad",
    "opt": "-F 50 -p instances/quad.100 --cache",
    "col": ">{{\\nprounddigits{2}}}N{3}{2}"
},
{
    "id": "nk",
    "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}"
},
```

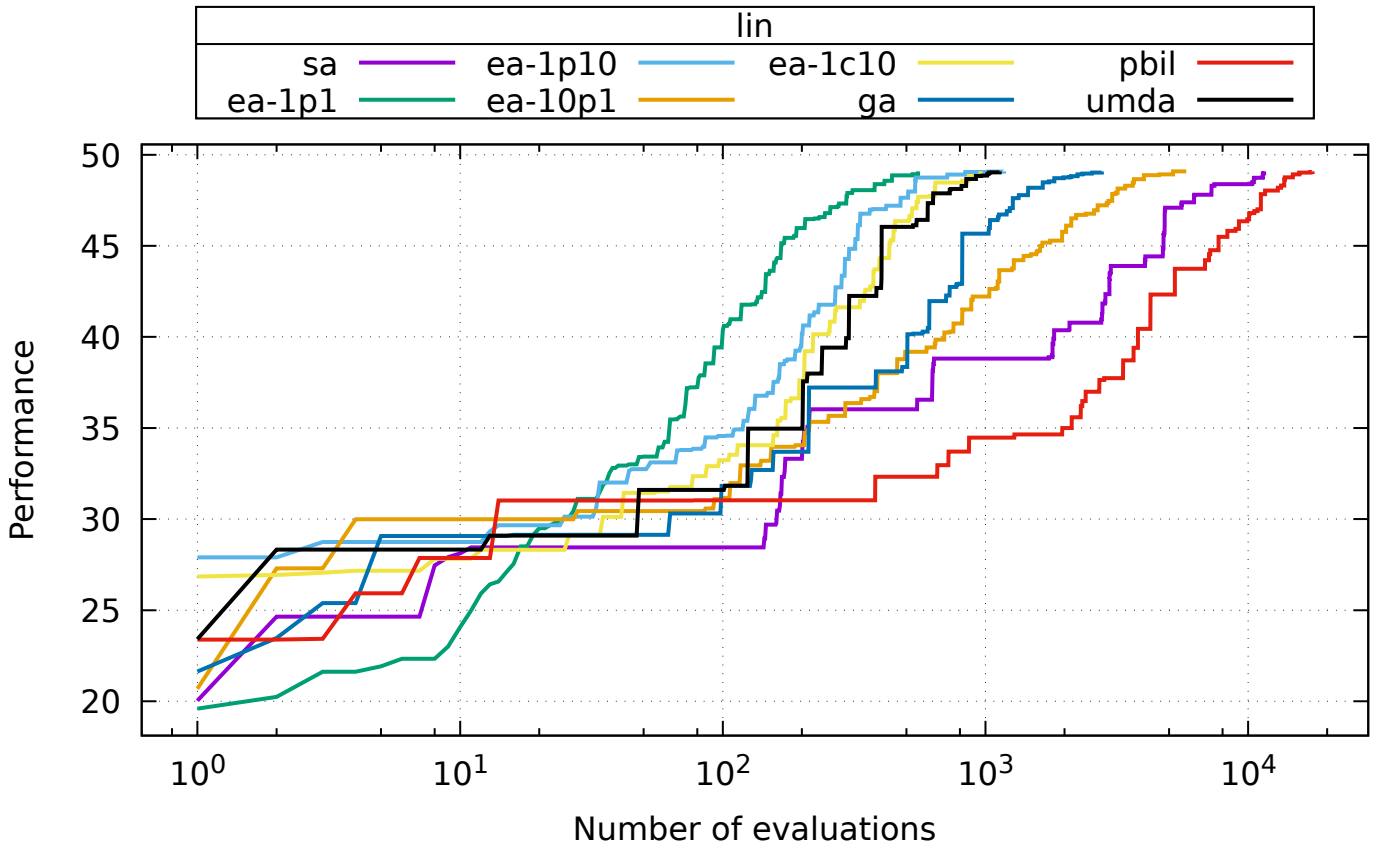
```
    {
        "id": "labs",
        "opt": "-F 80",
        "col": ">{{\\nprounddigits{2}}}N{1}{2}"
    },
    {
        "id": "ep",
        "opt": "-F 90 -p instances/ep.100",
        "reverse": true,
        "logscale": true,
        "col": ">{{\\nprounddigits{2}}}N{1}{2}"
    },
    {
        "id": "cancel",
        "opt": "-F 100 -s 99",
        "reverse": true,
        "col": ">{{\\nprounddigits{2}}}N{1}{2}"
    },
    {
        "id": "trap",
        "opt": "-F 110 --fun-num-traps 10",
        "col": ">{{\\nprounddigits{0}}}N{3}{0}"
    },
    {
        "id": "hiff",
        "opt": "-F 120 -s 128",
        "col": ">{{\\nprounddigits{0}}}N{3}{0}"
    },
    {
        "id": "plateau",
        "opt": "-F 130",
        "col": ">{{\\nprounddigits{0}}}N{3}{0}"
    }
],
"algorithms": [
    {
        "id": "sa",
        "opt": "-A 200 --sa-rate 1.05 --sa-num-trials 10"
    },
    {
        "id": "ea-1p1",
        "opt": "-A 300"
    },
    {
        "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",
            "opt": "-A 600 -x 100 -y 10"
        }
    ]
}
```

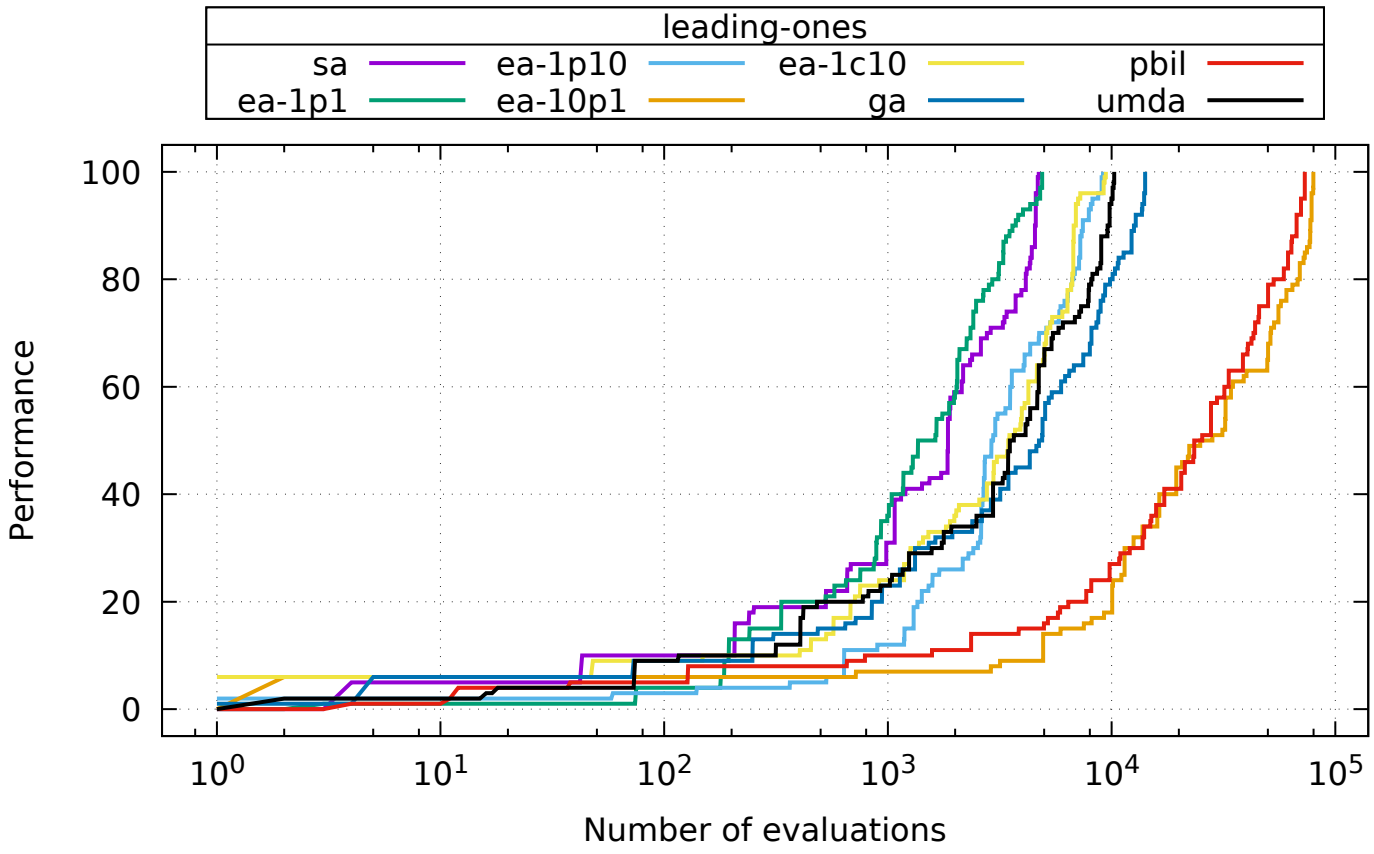
3 one-max



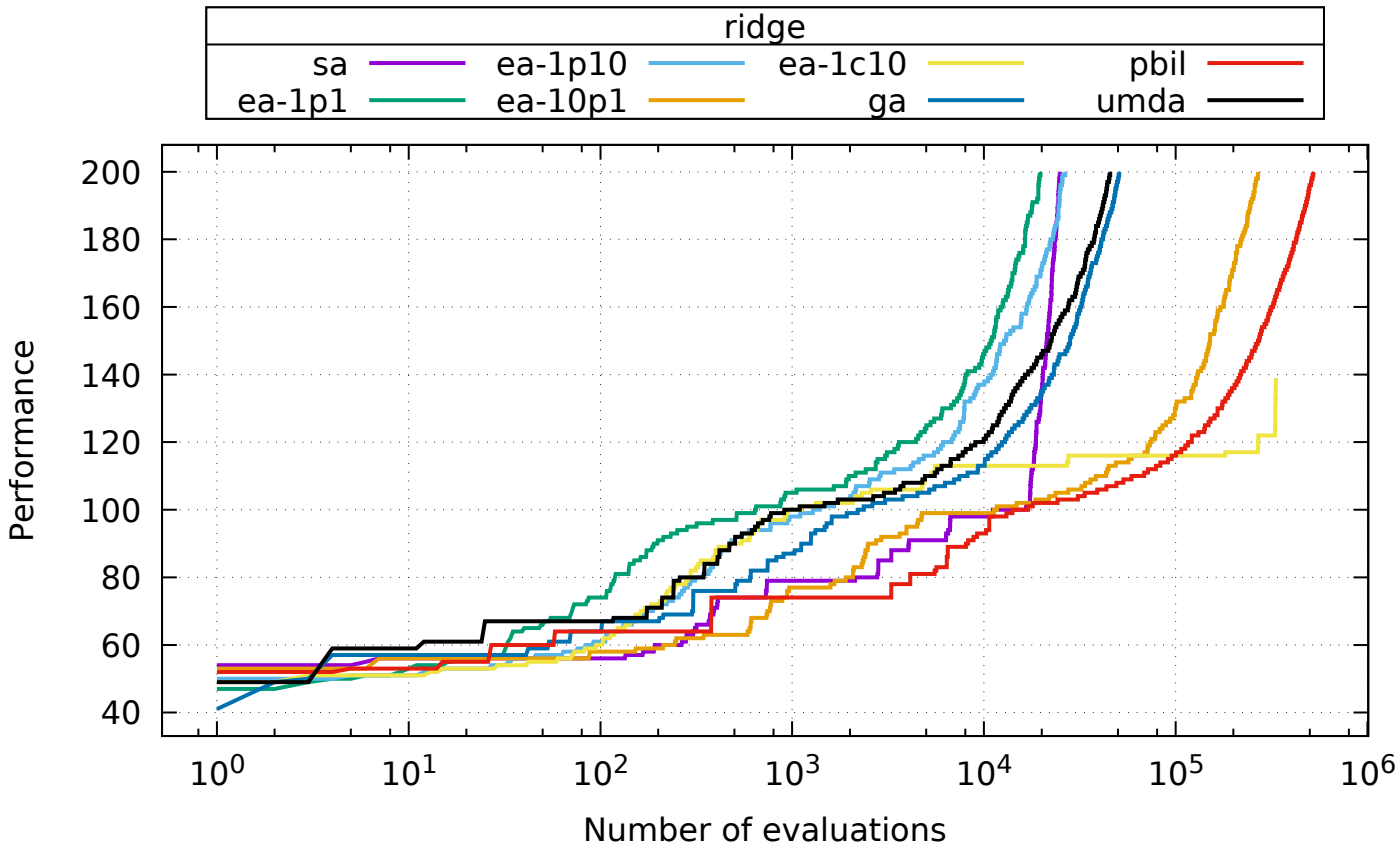
4 lin



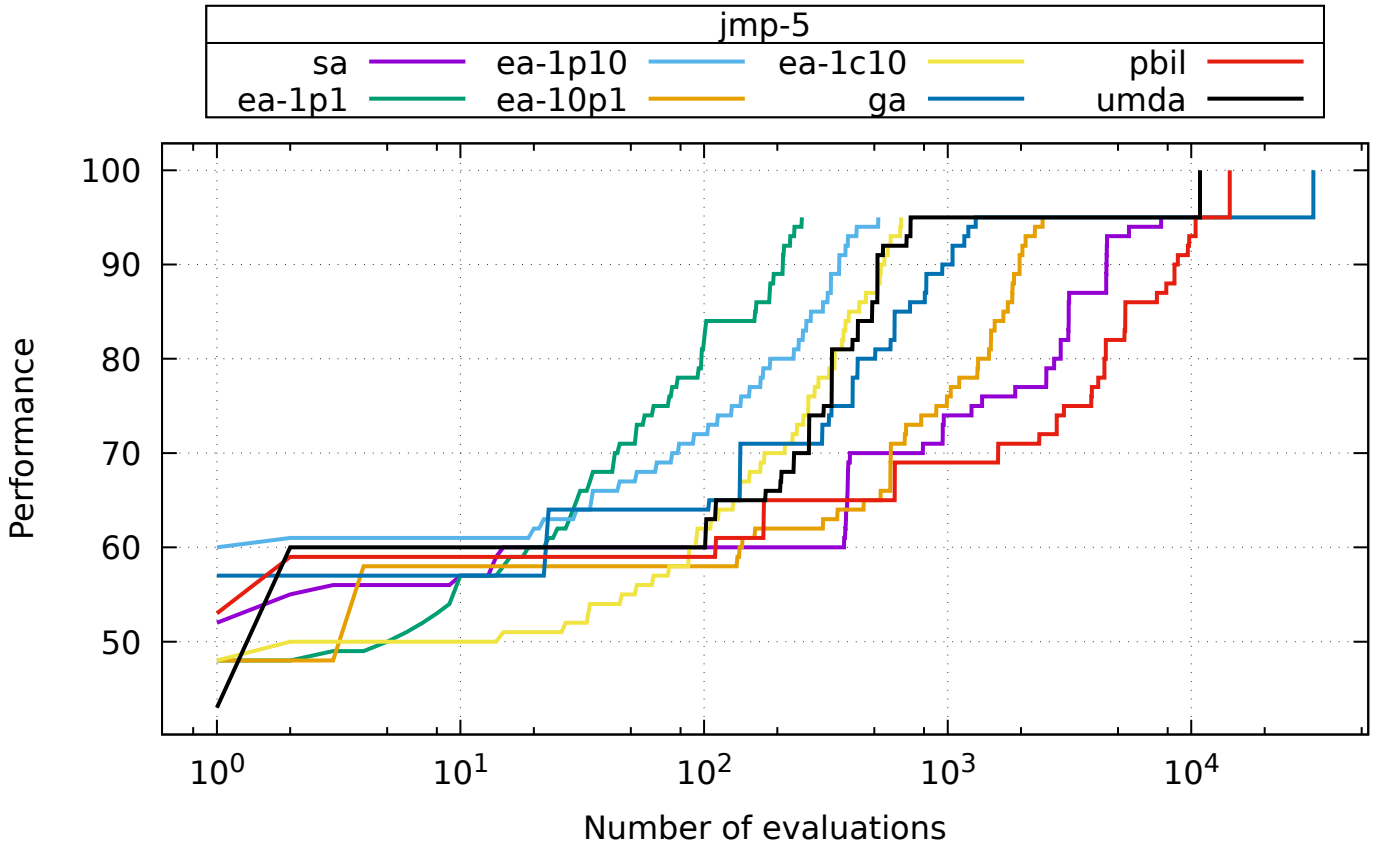
5 leading-ones



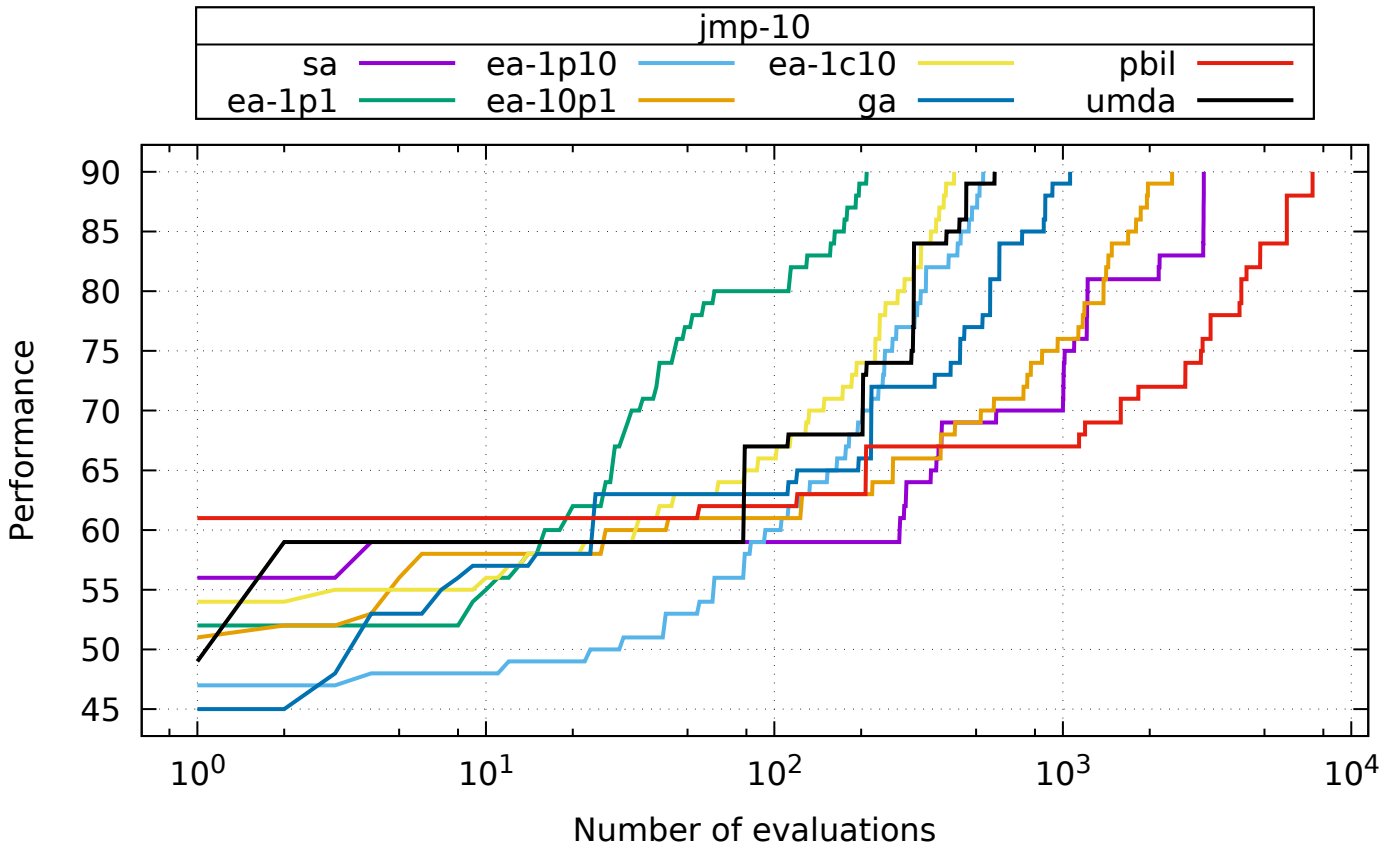
6 ridge



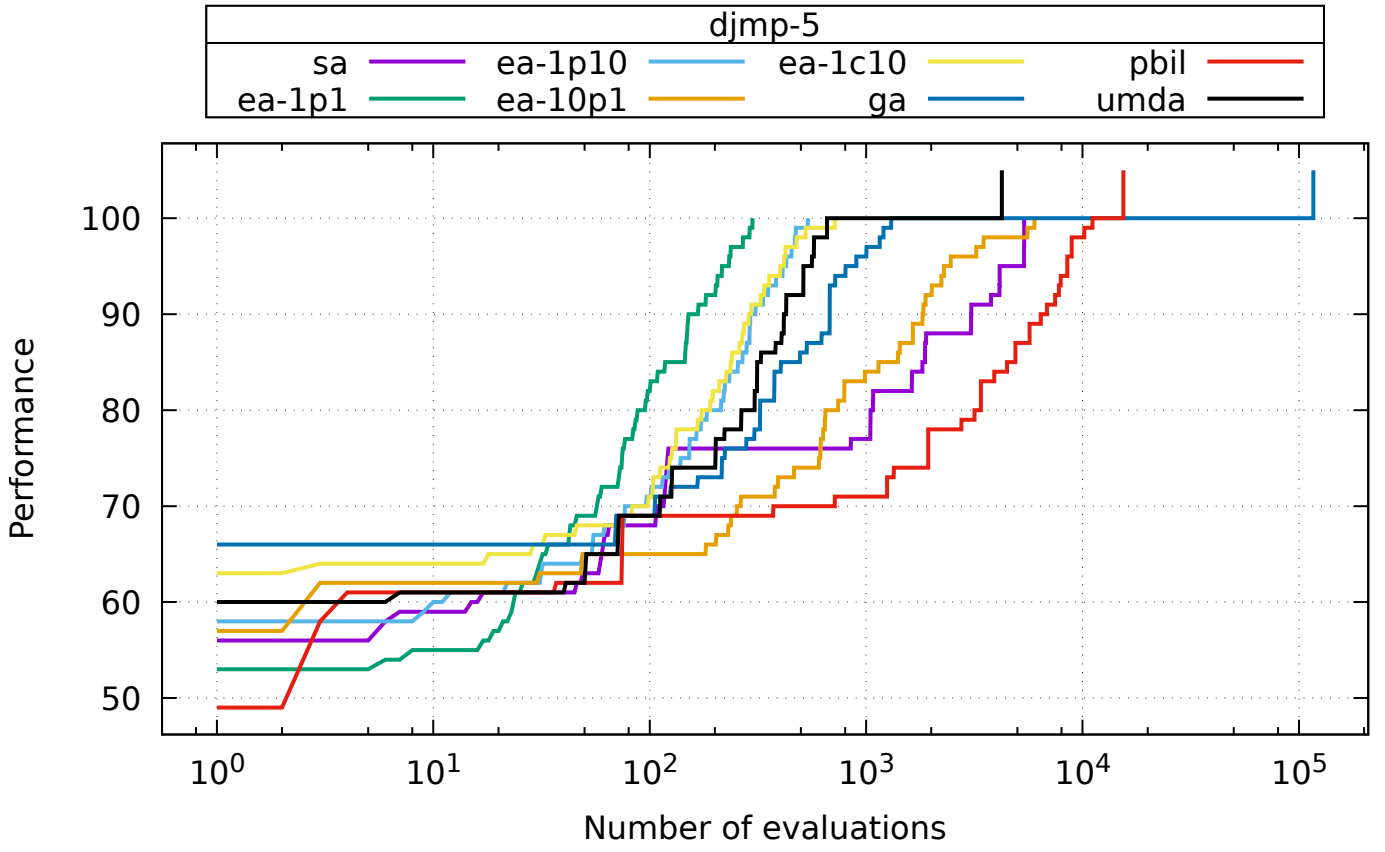
7 jmp-5



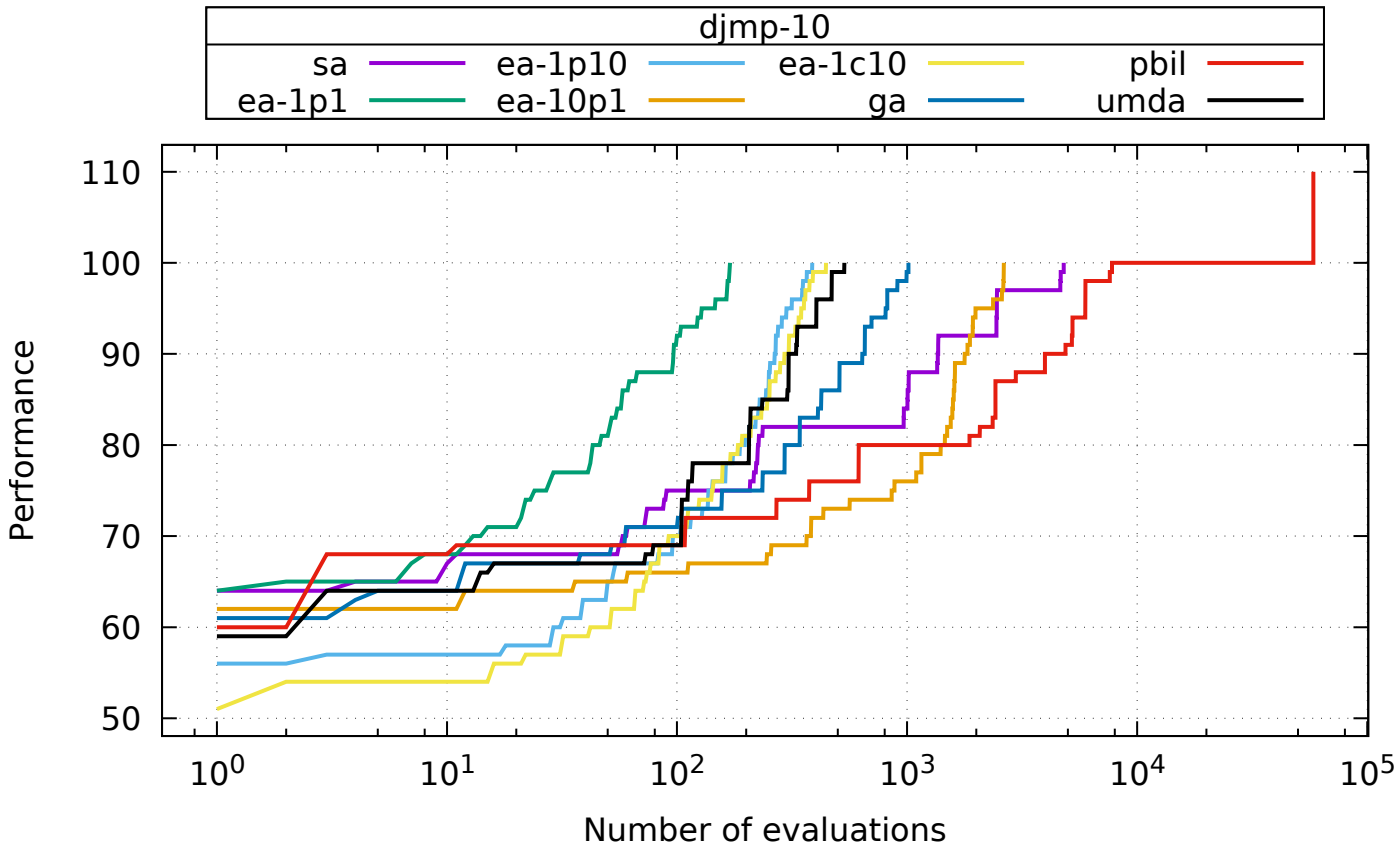
8 jmp-10



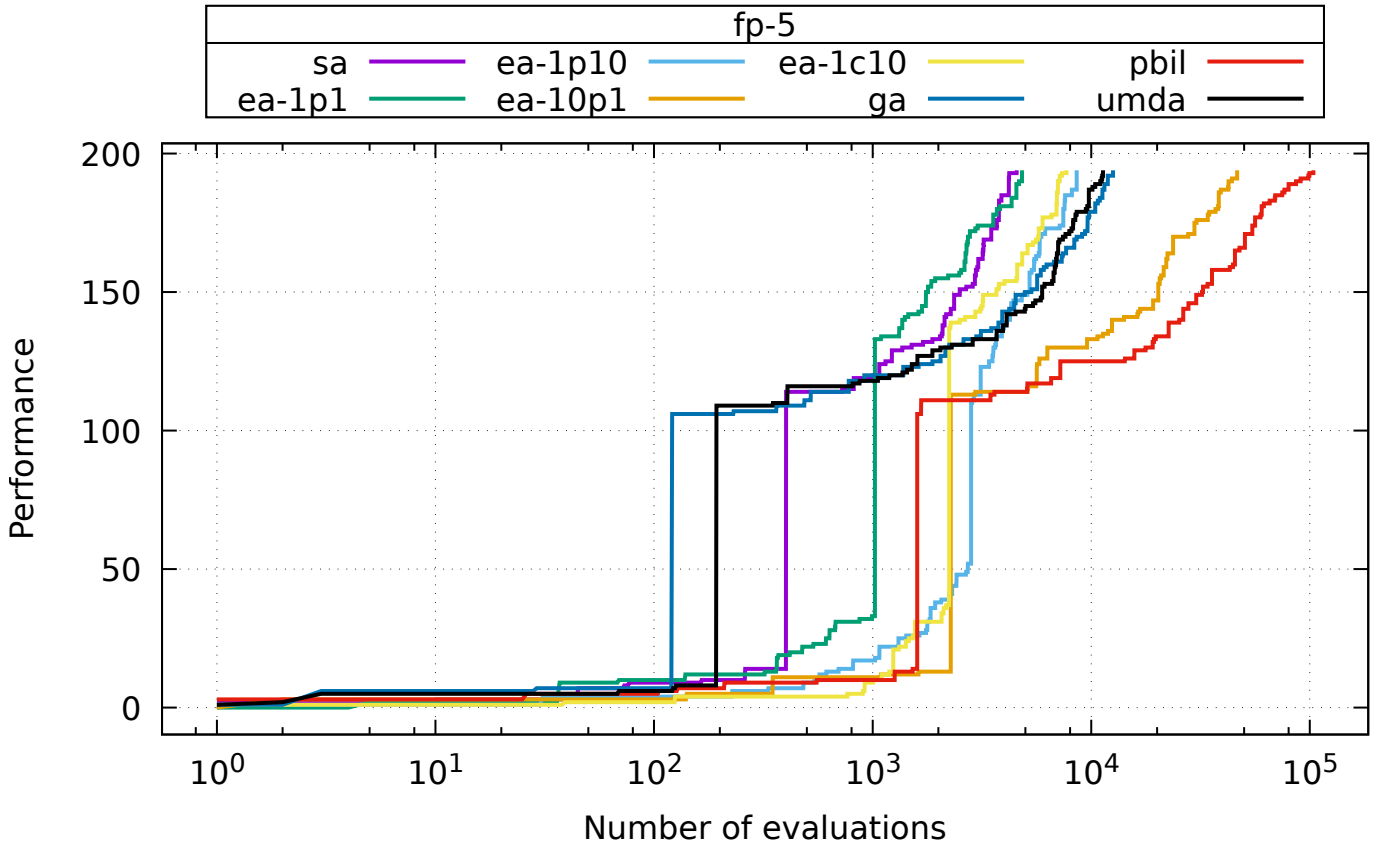
9 djmp-5



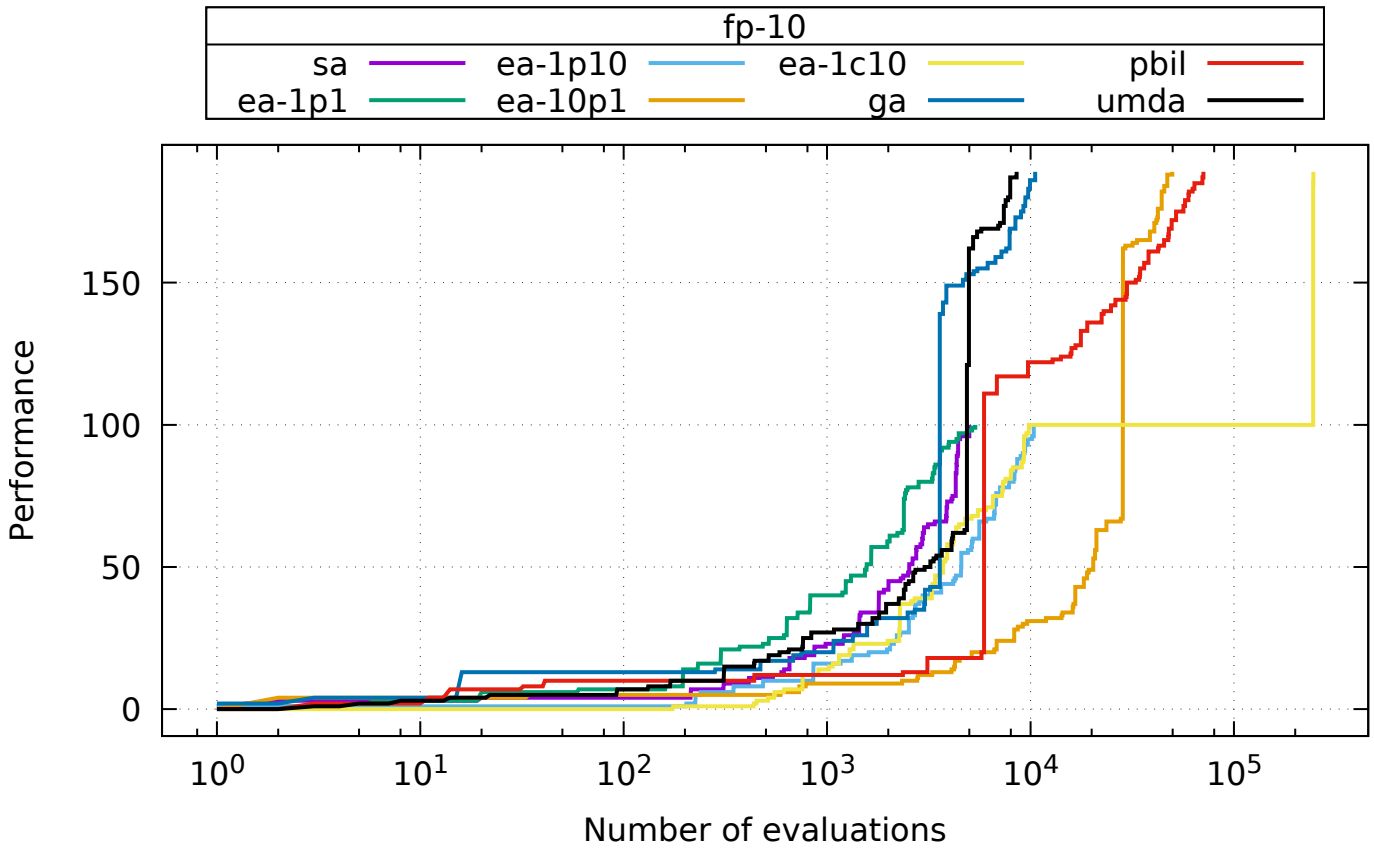
10 djmp-10



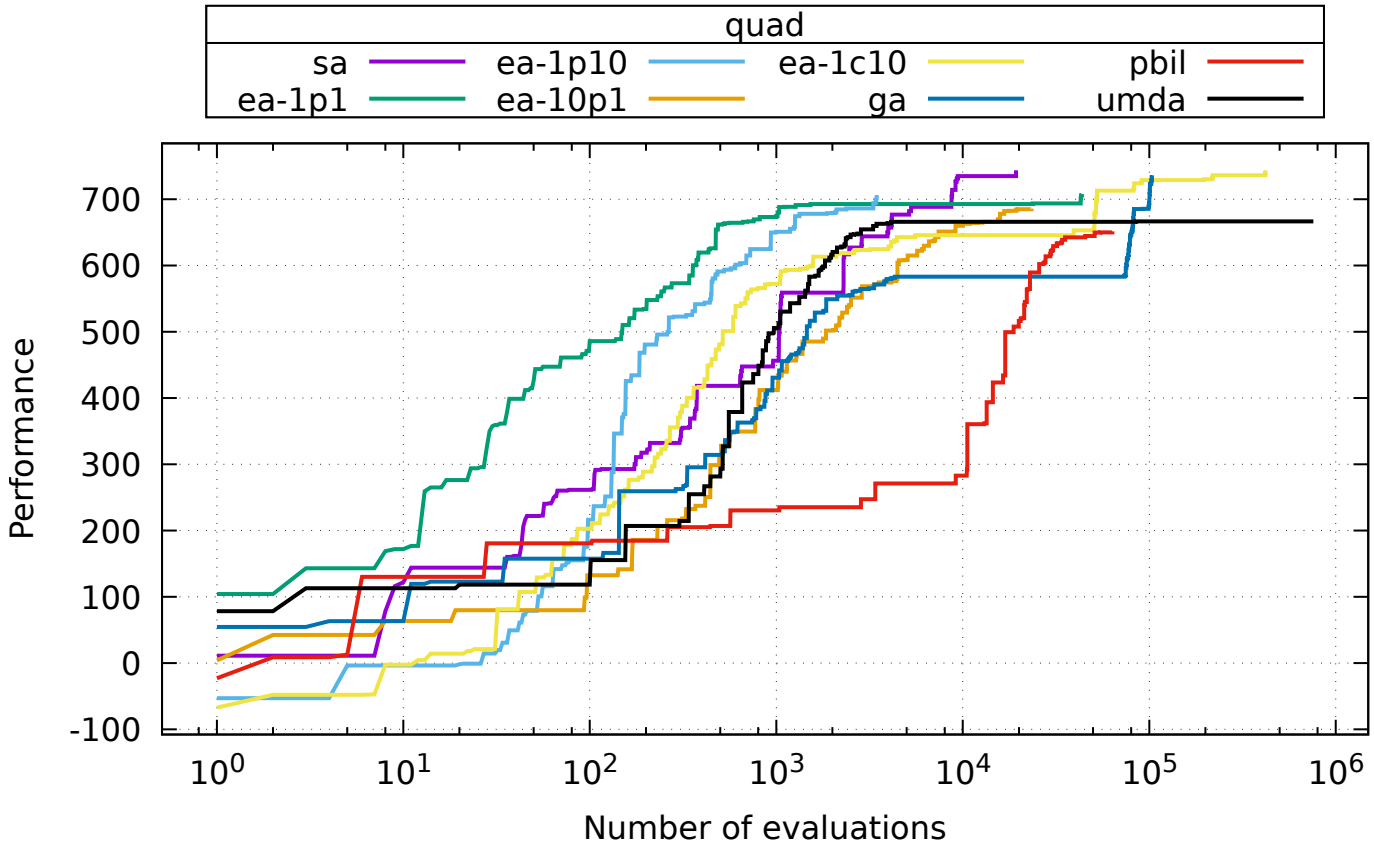
11 fp-5



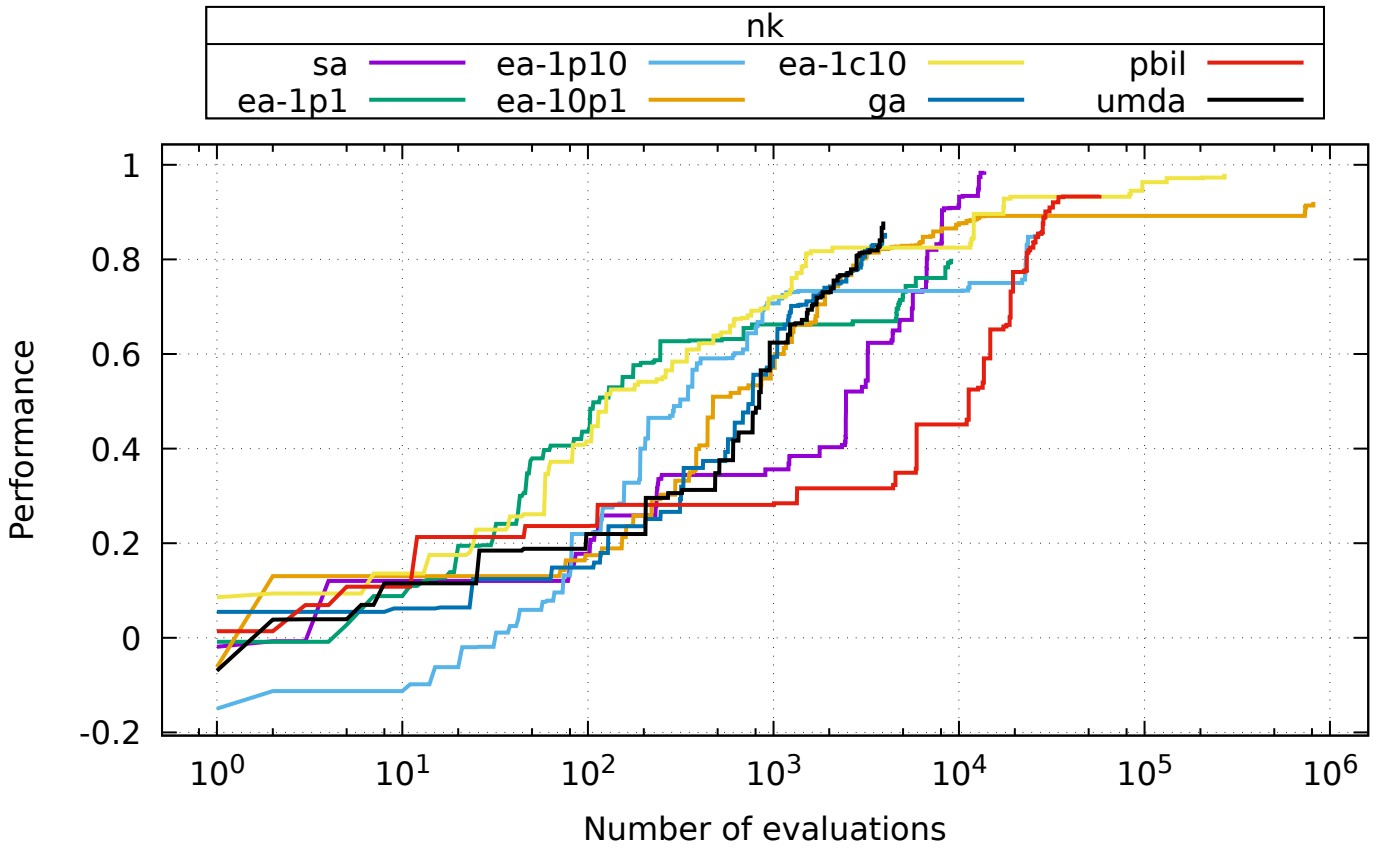
12 fp-10



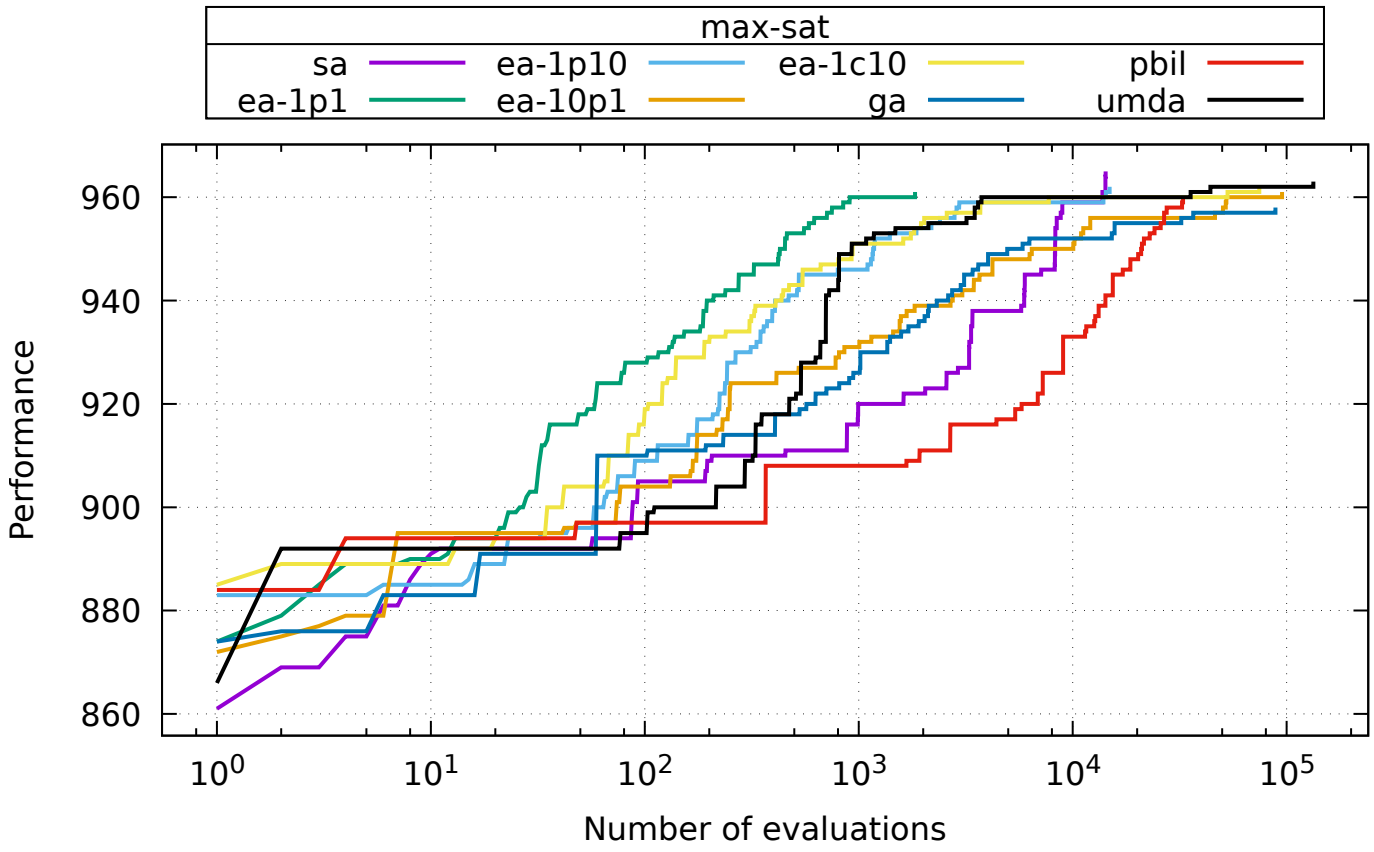
13 quad



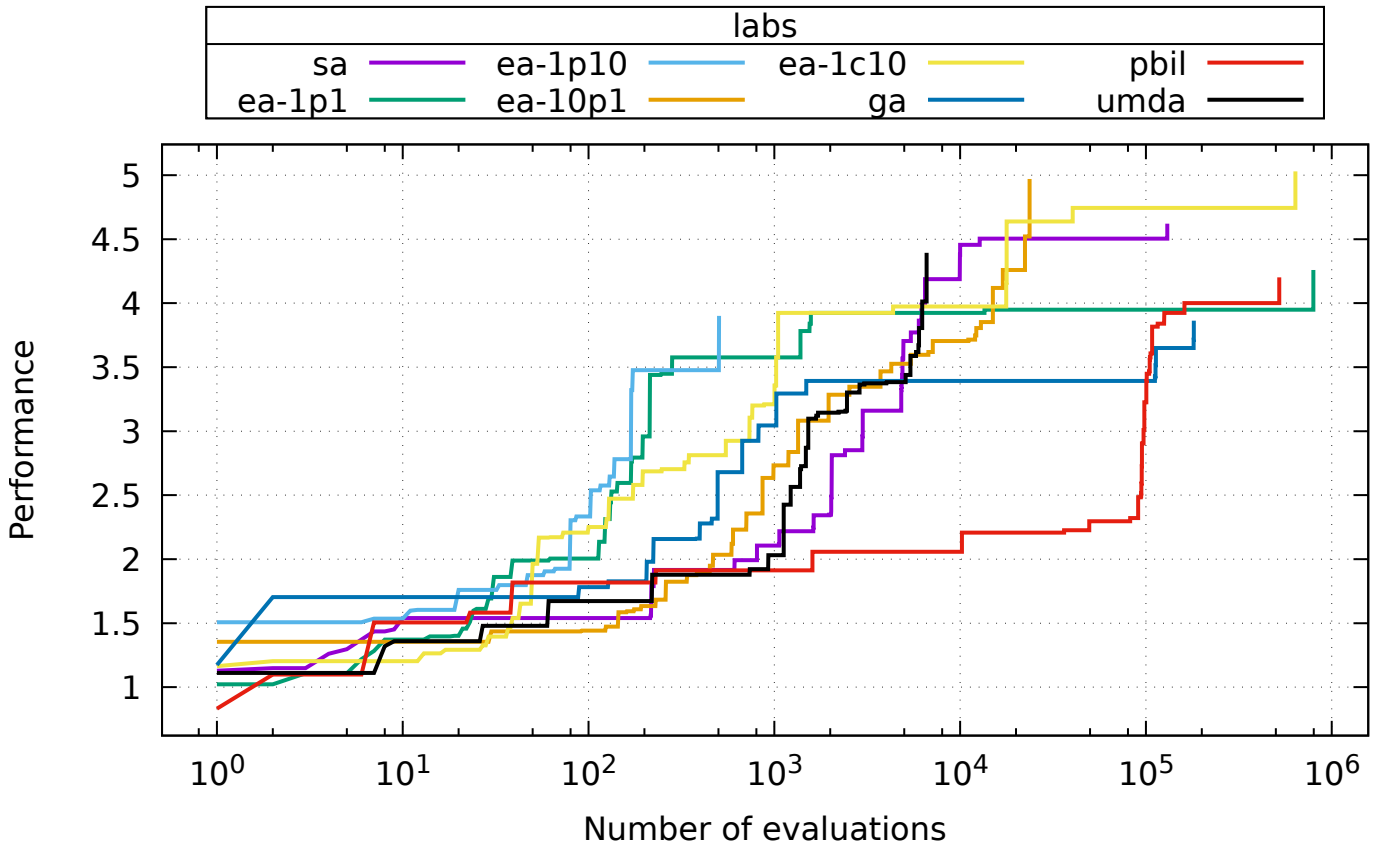
14 nk



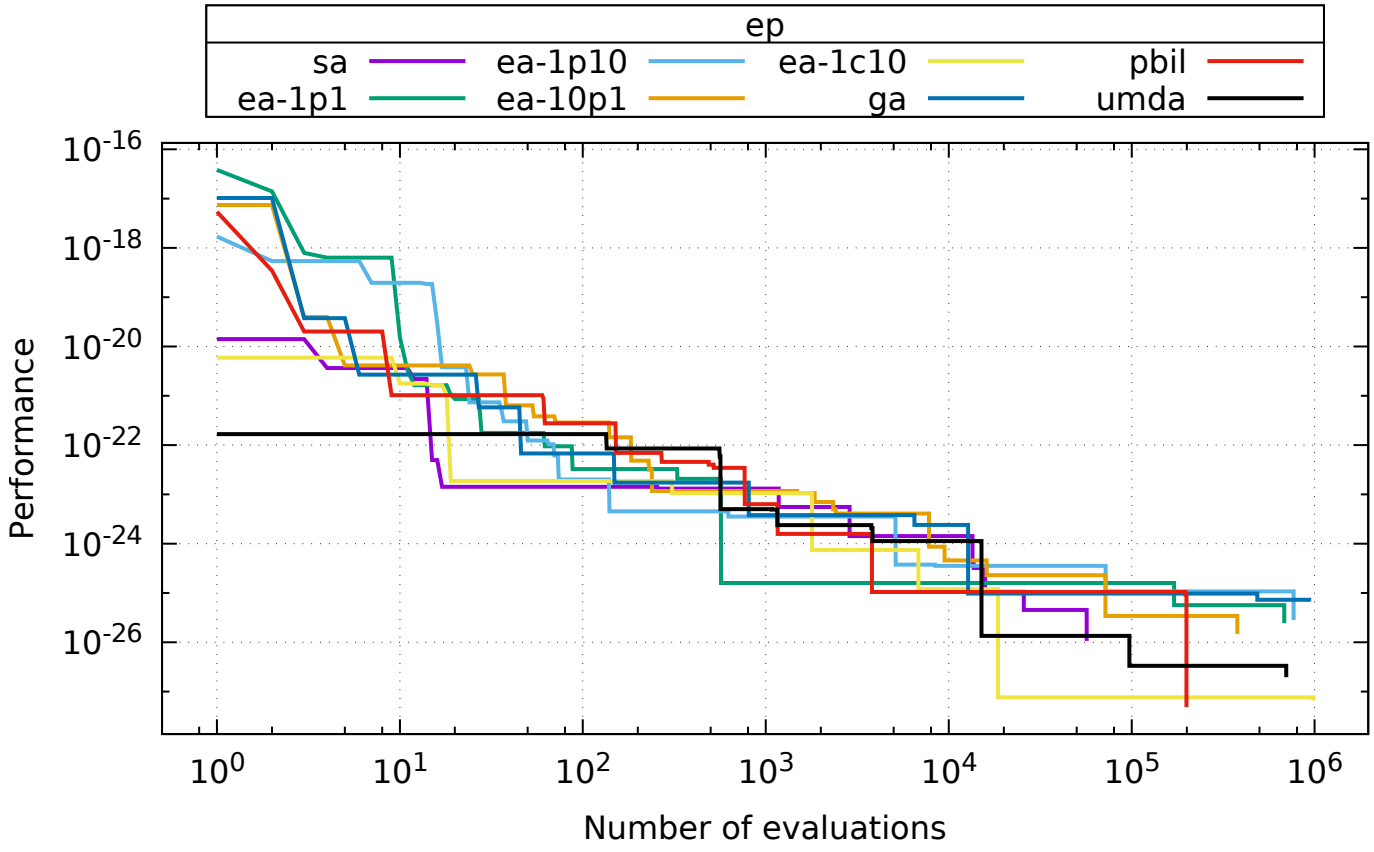
15 max-sat



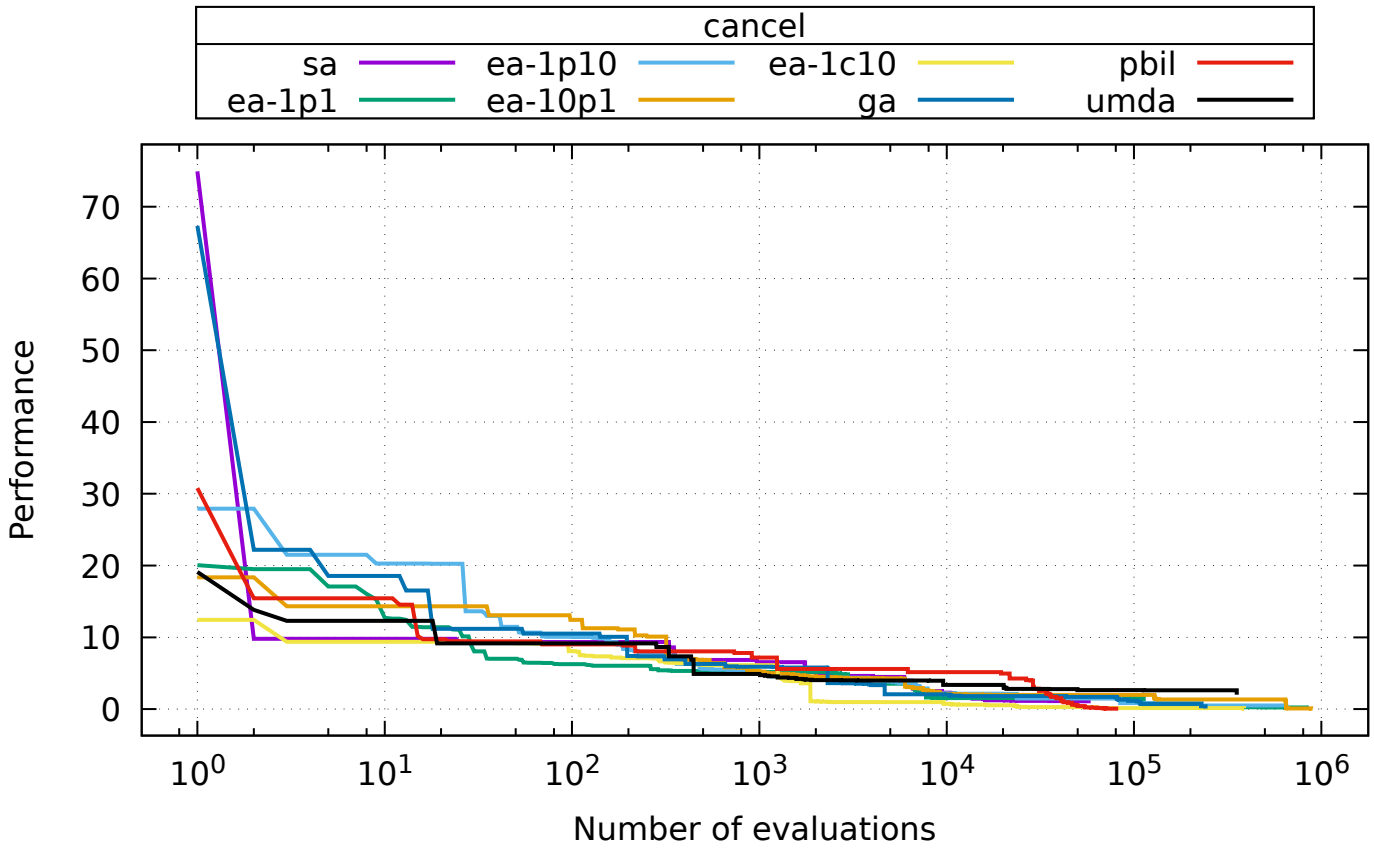
16 labs


labs
sa
ea-1p1
ea-1p10
ea-10p1
ea-1c10
ga
pbil
umda
Performance
Number of evaluations

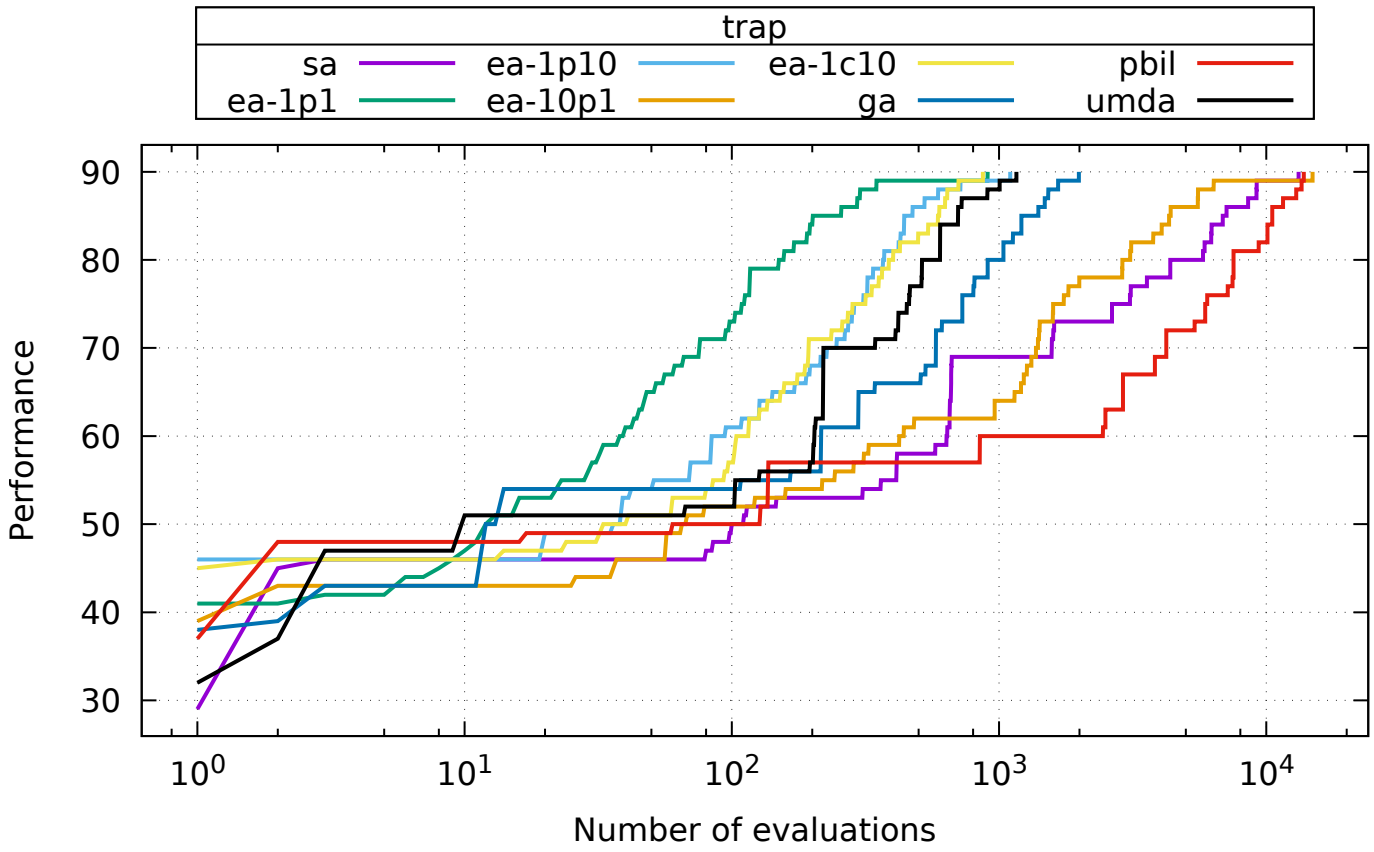
17 ep


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

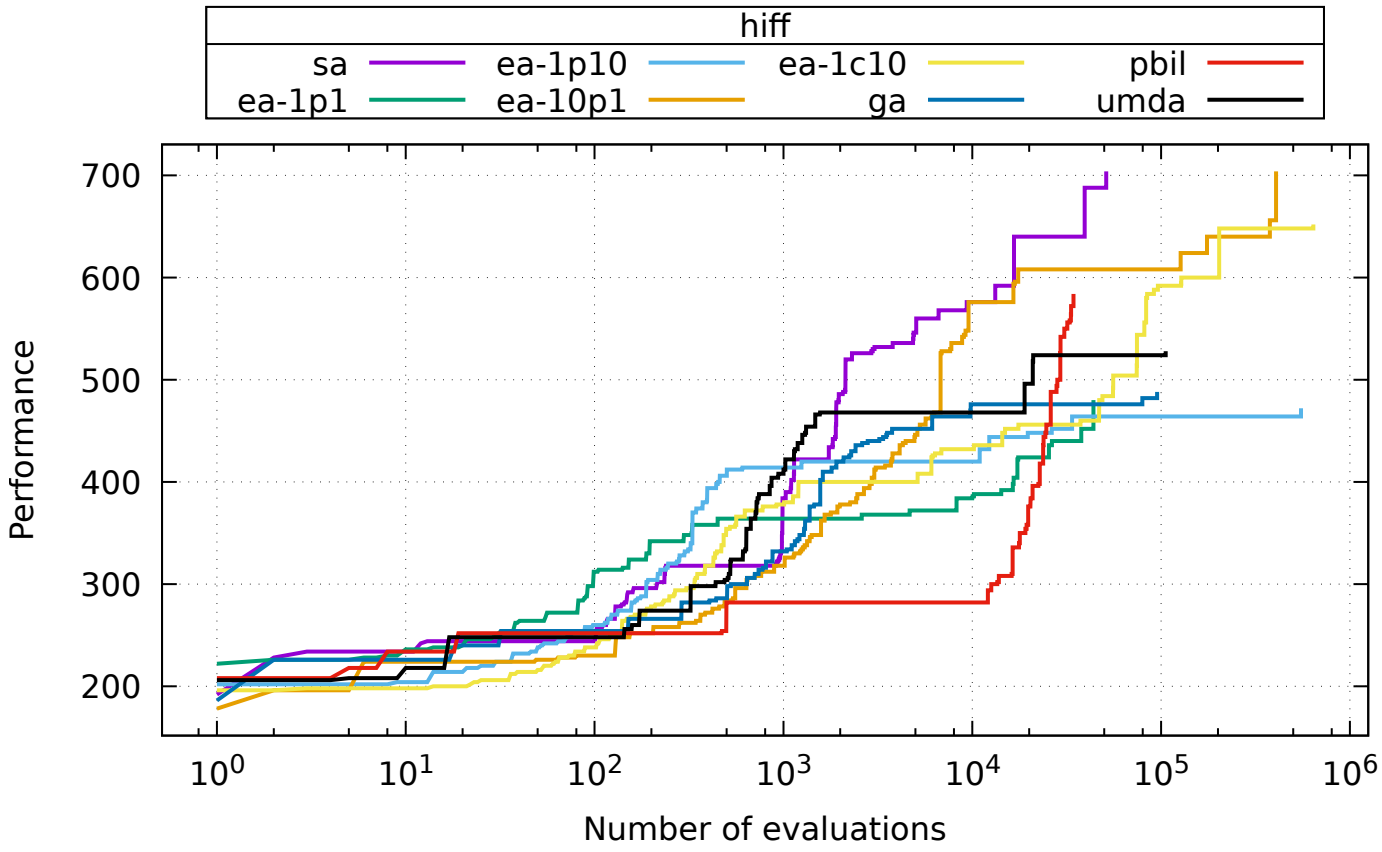
18 cancel



19 trap



20 hiff



21 plateau