

HNCO

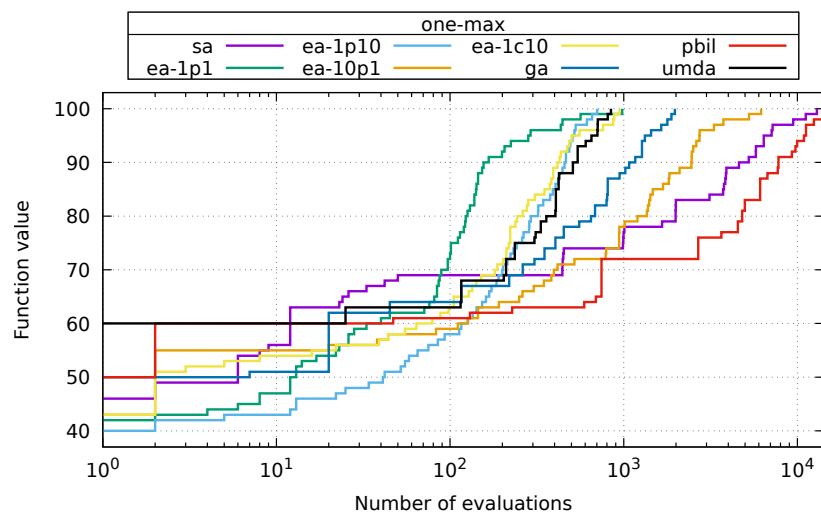
Evolution of maximum of various black box optimization algorithms

May 18, 2020

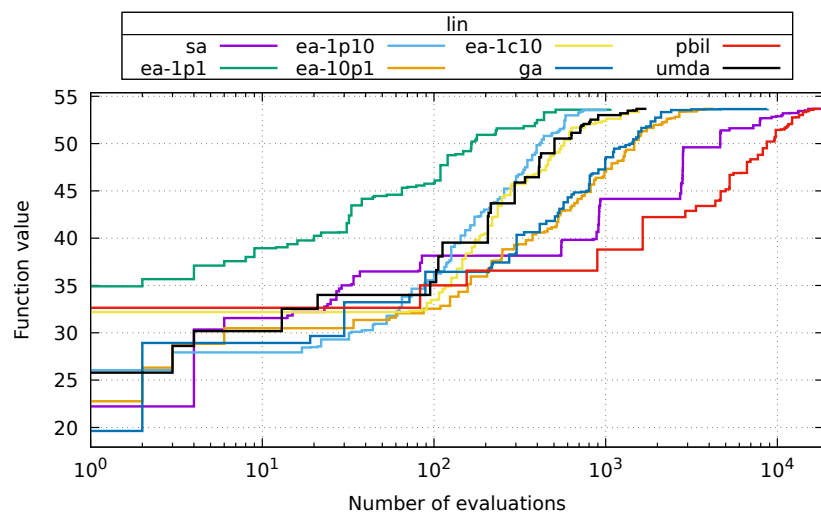
Contents

1	one-max	1
2	lin	1
3	leading-ones	2
4	ridge	2
5	jmp-5	2
6	jmp-10	3
7	djmp-5	3
8	djmp-10	3
9	fp-5	4
10	fp-10	4
11	nk	4
12	max-sat	5
13	labs	5
14	ep	5
15	cancel	6
16	trap	6
17	hiff	6
18	plateau	7
19	walsh2	7
A	Plan	7
B	Default parameters	9

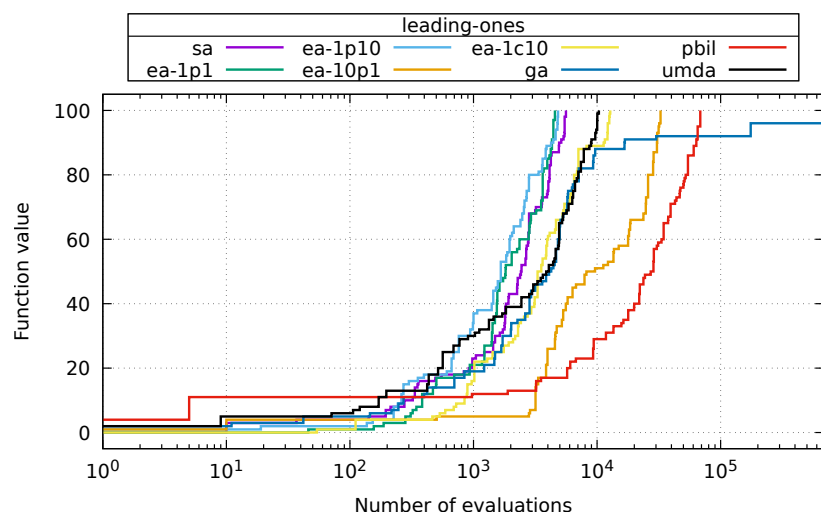
1 one-max



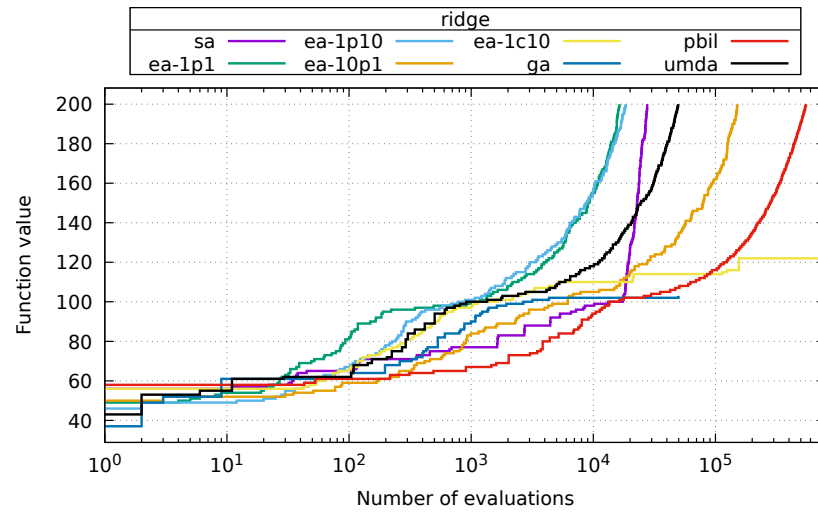
2 lin



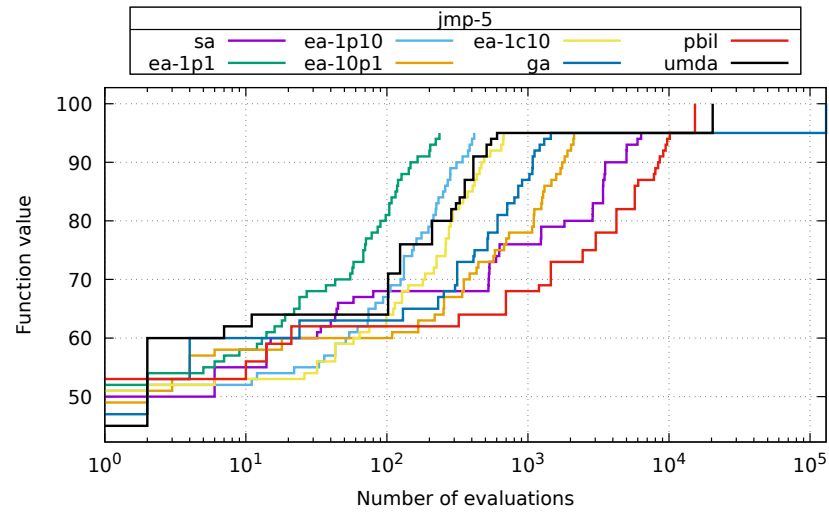
3 leading-ones



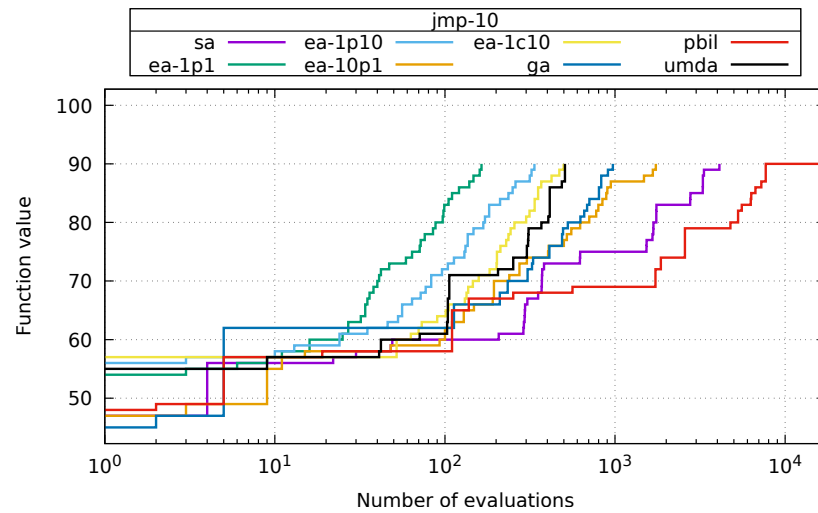
4 ridge



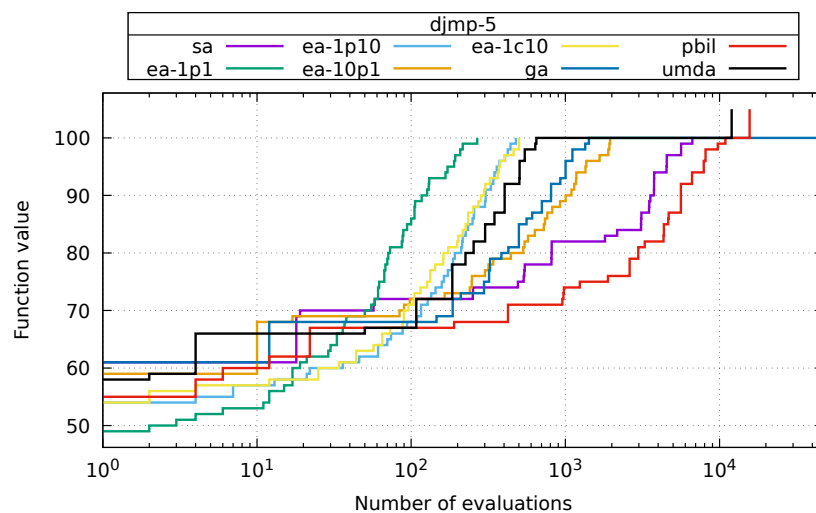
5 jmp-5



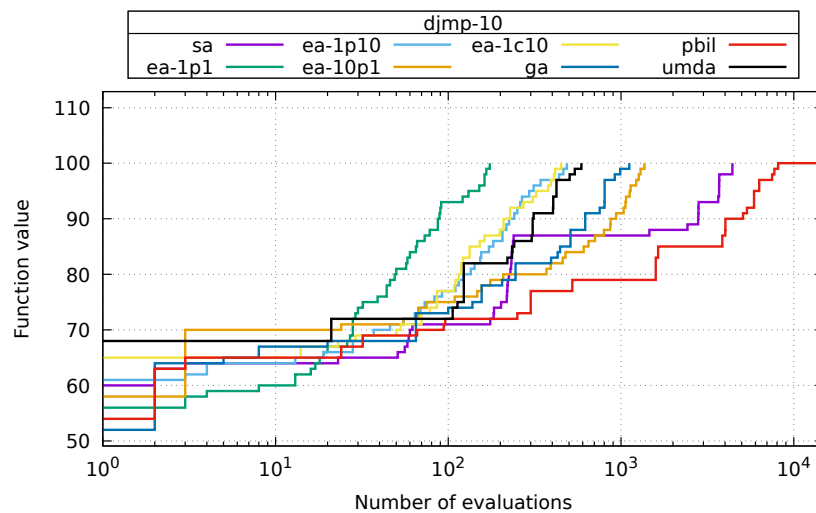
6 jmp-10



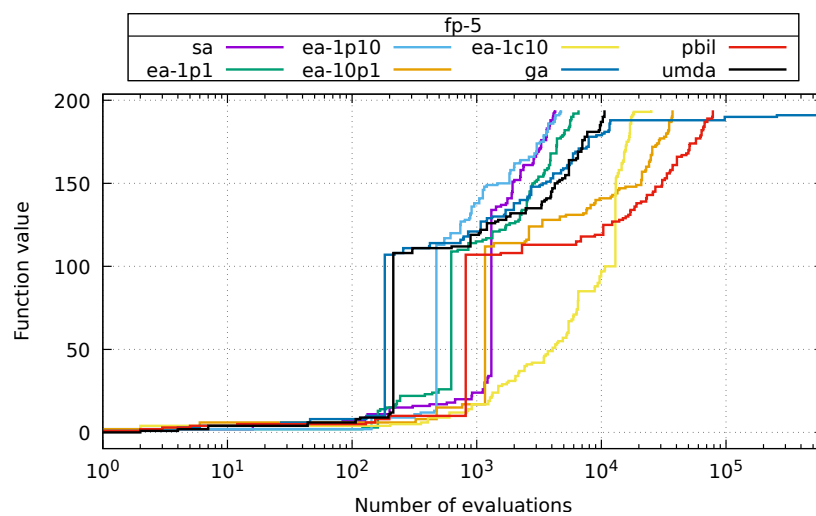
7 djump-5



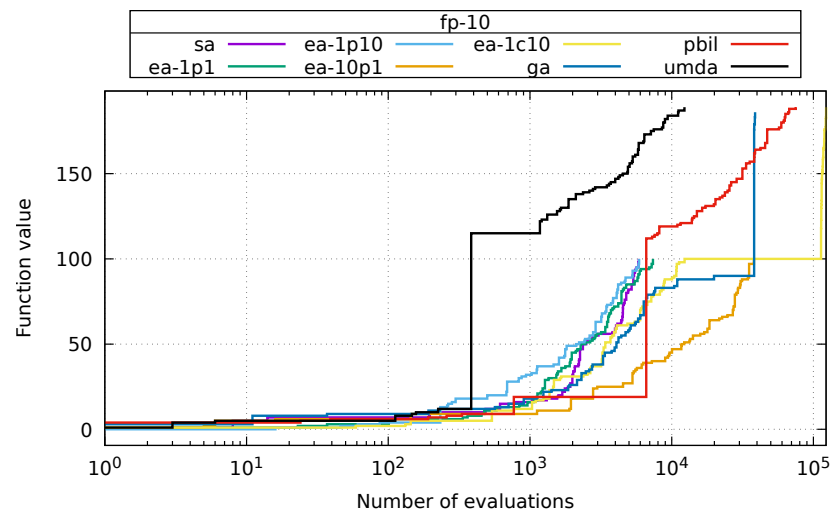
8 djump-10



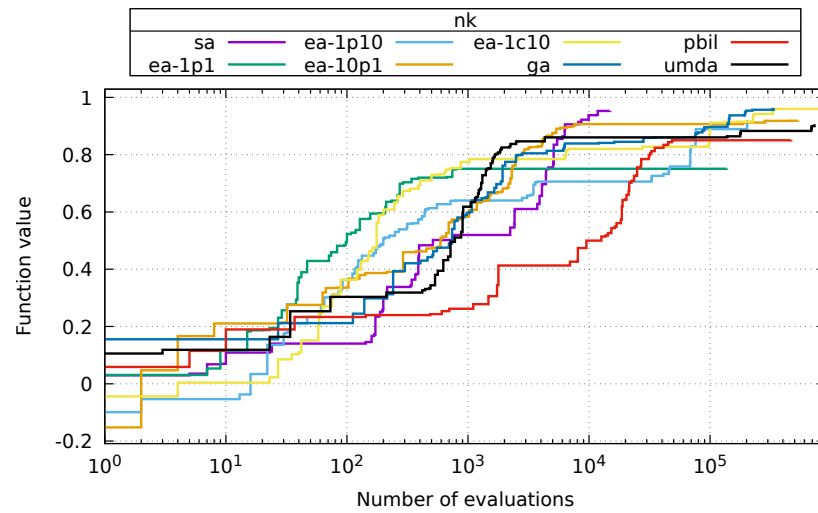
9 fp-5



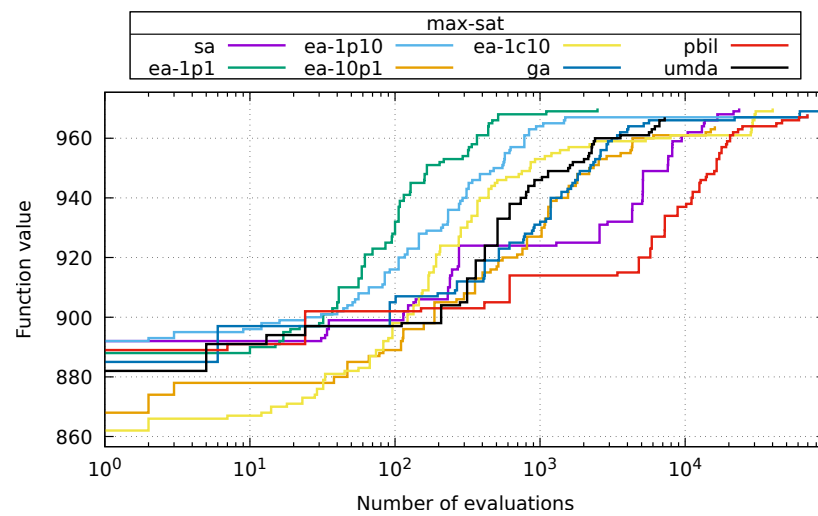
10 fp-10



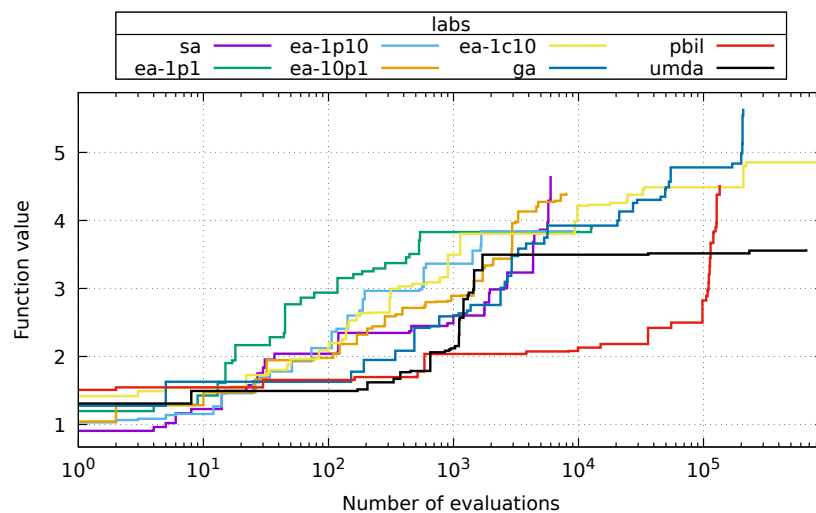
11 nk



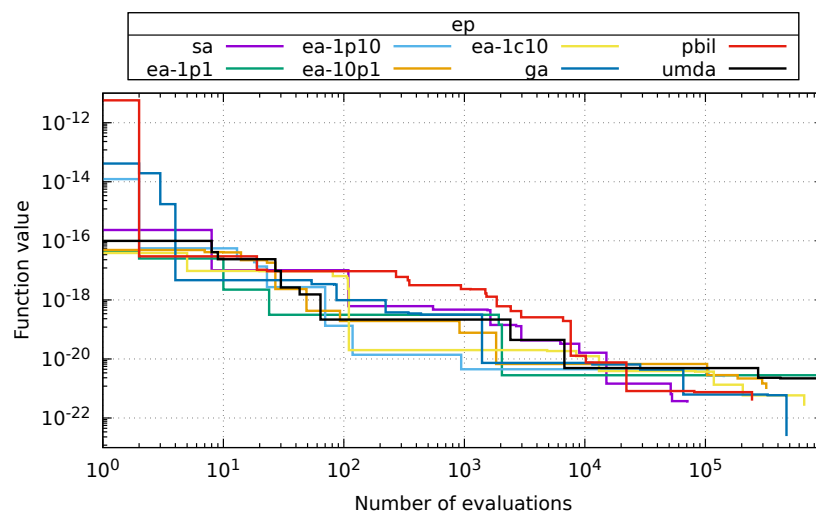
12 max-sat



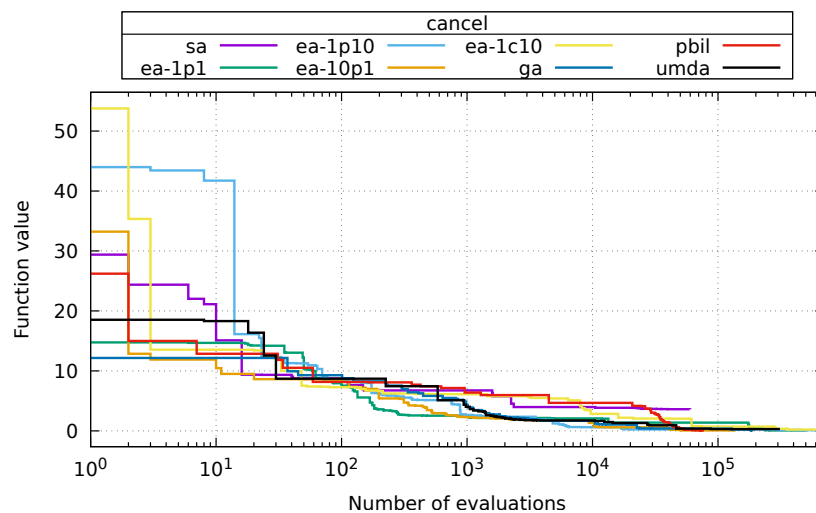
13 labs



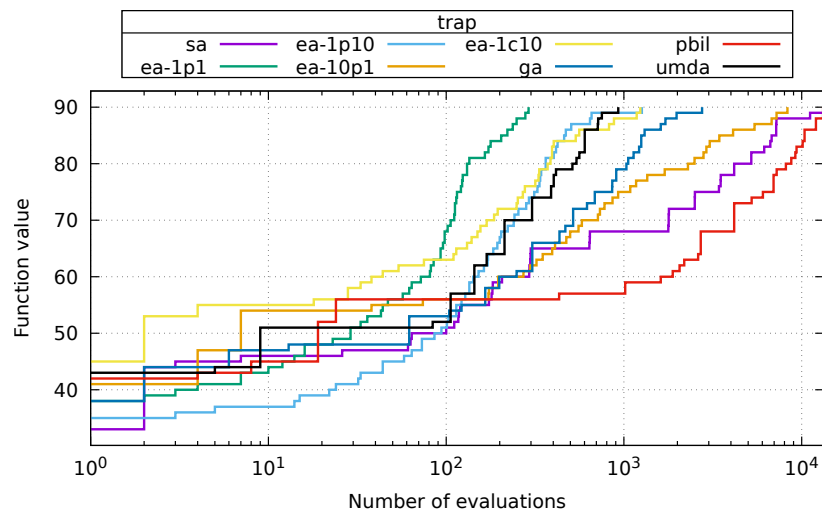
14 ep



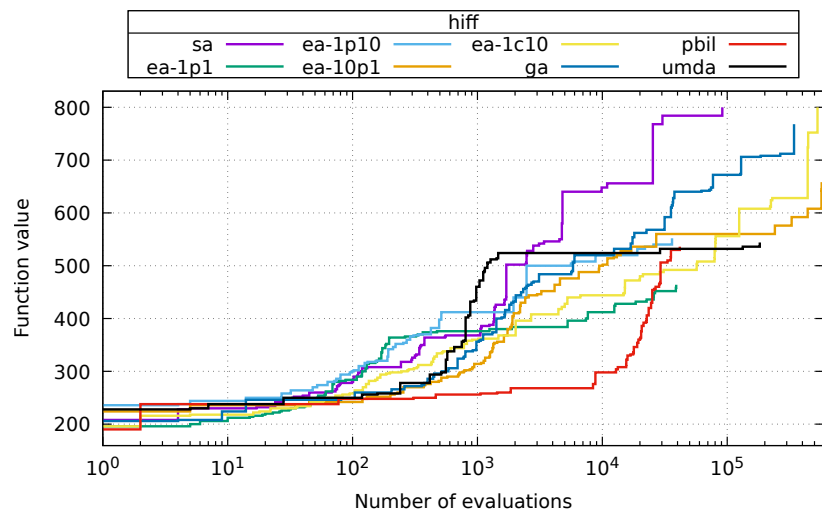
15 cancel



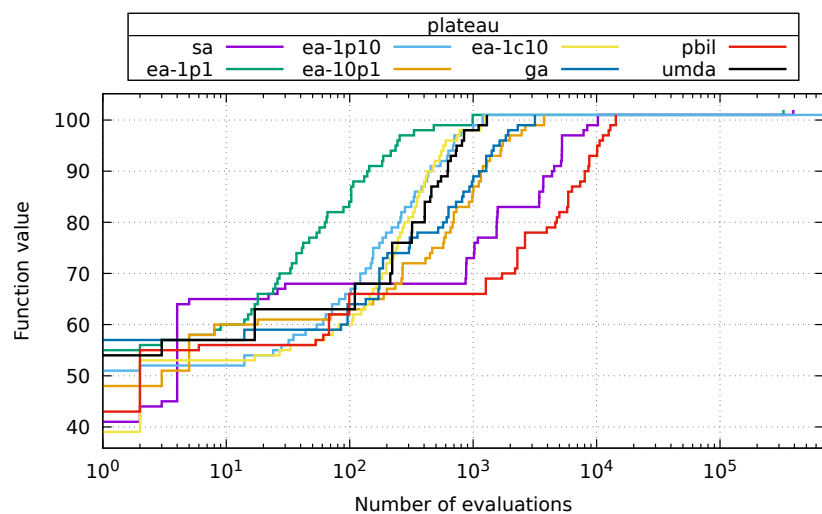
16 trap

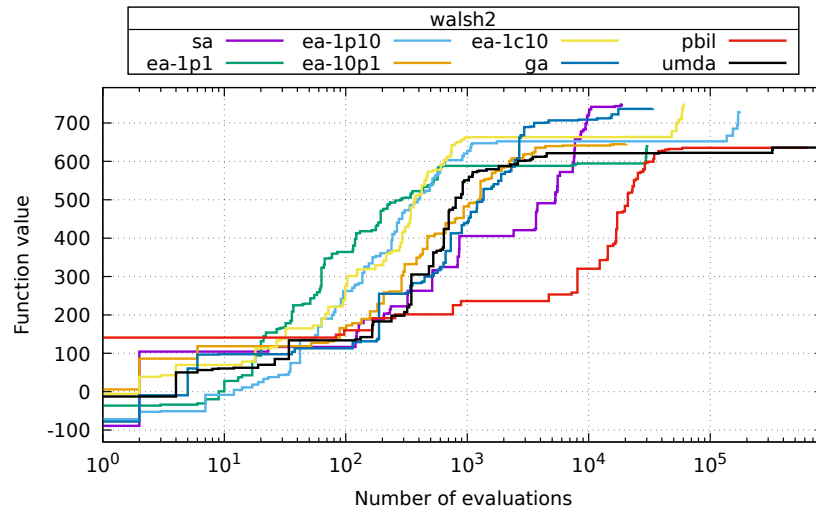


17 hiff



18 plateau





A Plan

```
{
  "exec": "hnco",
  "opt": "--log-improvement --map 1 --map-random -s 100 -b 1000000",
  "parallel": true,
  "results": "results",
  "graphics": "graphics",
  "report": "report",
  "functions": [
    {
      "id": "one-max",
      "opt": "-F 0 --stop-on-maximum"
    },
    {
      "id": "lin",
      "opt": "-F 1 -p instances/lin.100"
    },
    {
      "id": "leading-ones",
      "opt": "-F 10 --stop-on-maximum"
    },
    {
      "id": "ridge",
      "opt": "-F 11 --stop-on-maximum"
    },
    {
      "id": "jmp-5",
      "opt": "-F 30 --stop-on-maximum -t 5"
    },
    {
      "id": "jmp-10",
      "opt": "-F 30 --stop-on-maximum -t 10"
    },
    {
      "id": "djmp-5",
      "opt": "-F 31 --stop-on-maximum -t 5"
    },
    {
      "id": "djmp-10",
      "opt": "-F 31 --stop-on-maximum -t 10"
    }
  ]
}
```



```

    "id": "fp-5",
    "opt": "-F 40 --stop-on-maximum -t 5"
  },
  {
    "id": "fp-10",
    "opt": "-F 40 --stop-on-maximum -t 10"
  },
  {
    "id": "nk",
    "opt": "-F 60 -p instances/nk.100.4"
  },
  {
    "id": "max-sat",
    "opt": "-F 70 -p instances/ms.100.3.1000"
  },
  {
    "id": "labs",
    "opt": "-F 81"
  },
  {
    "id": "ep",
    "opt": "-F 90 -p instances/ep.100",
    "reverse": true,
    "logscale": true
  },
  {
    "id": "cancel",
    "opt": "-F 100 -s 99",
    "reverse": true
  },
  {
    "id": "trap",
    "opt": "-F 110 --stop-on-maximum --fn-num-traps 10"
  },
  {
    "id": "hiff",
    "opt": "-F 120 --stop-on-maximum -s 128"
  },
  {
    "id": "plateau",
    "opt": "-F 130 --stop-on-maximum"
  },
  {
    "id": "walsh2",
    "opt": "-F 162 -p instances/walsh2.100"
  }
],
"algorithms": [
  {
    "id": "sa",
    "opt": "-A 200 --sa-beta-ratio 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 --allow-stay"
    },
    {
        "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"
    }
]
}

```

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
# 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_probability = 1
# neighborhood = 0
# neighborhood_iterator = 0
# noise_stddev = 1
# num_iterations = 0
# num_threads = 1
# path = function.txt
# pn_mutation_probability = 1
# pn_neighborhood = 0
# pn_radius = 2

```

```
# population_size = 10
# pv_log_num_components = 5
# radius = 2
# real_expression = (1-x)^2+100*(y-x^2)^2
# real_lower_bound = -2
# real_num_bits = 8
# real_upper_bound = 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 = 0.14
# Generated from hnco.json
```