

HNCO

Fixed target analysis

November 14, 2020

Contents

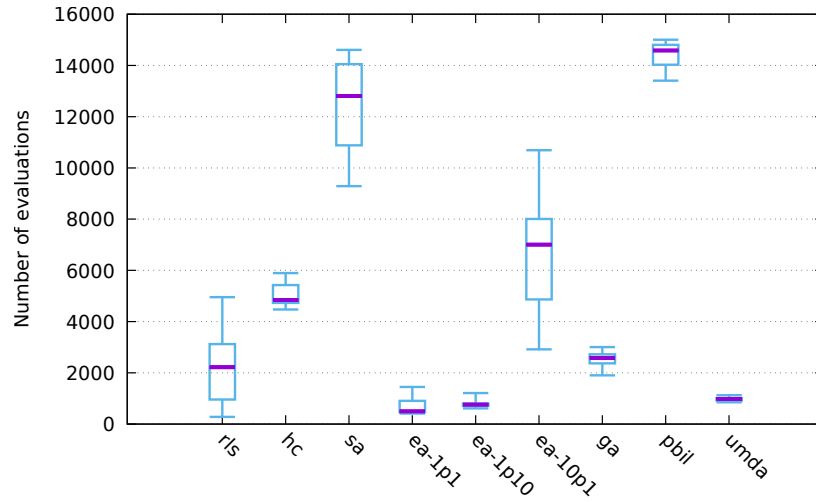
1	Global results	1
2	Function one-max	1
3	Function leading-ones	2
4	Function ridge	3
A	Plan	3
B	Default parameters	4

1 Global results

Algorithm	Rank					Success
	min	Q_1	med.	Q_3	max	
hc	1	1	1	3	6	100.0 %
ea-1p1	1	1	2	2	3	100.0 %
ea-1p10	2	2	3	3	4	100.0 %
sa	2	3	4	6	8	100.0 %
umda	3	4	5	5	5	100.0 %
ea-10p1	6	6	7	7	7	100.0 %
rls	4	5	6	7	8	66.0 %
pbil	8	8	9	9	9	66.0 %
ga	5	6	7	8	9	33.0 %

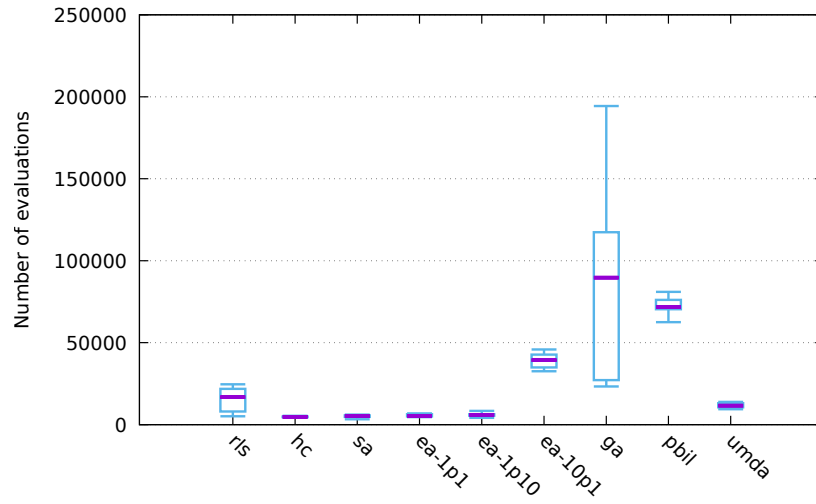
2 Function one-max

Algorithm	Number of evaluations					Success
	min	Q_1	med.	Q_3	max	
ea-1p1	409	463	497	904	1,450	100.0 %
ea-1p10	611	712	762	803	1,212	100.0 %
umda	849	921	980	1,015	1,125	100.0 %
rls	281	959	2,213	3,124	4,953	100.0 %
ga	1,902	2,369	2,588	2,725	3,006	100.0 %
hc	4,473	4,731	4,836	5,427	5,893	100.0 %
ea-10p1	2,916	4,866	7,005	8,005	10,692	100.0 %
sa	9,288	10,882	12,801	14,048	14,608	100.0 %
pbil	13,407	14,028	14,585	14,805	15,005	100.0 %



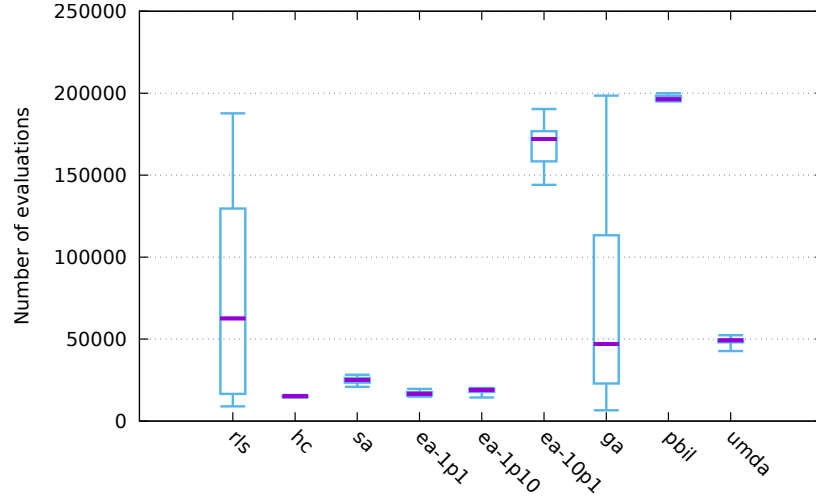
3 Function leading-ones

Algorithm	Number of evaluations					Success
	min	Q_1	med.	Q_3	max	
hc	4,398	4,626	4,751	4,900	5,398	100.0 %
sa	3,281	4,714	5,248	5,620	6,111	100.0 %
ea-1p1	4,636	5,028	5,394	6,360	6,880	100.0 %
ea-1p10	4,184	5,443	6,023	6,356	8,378	100.0 %
umda	9,426	10,577	11,585	13,052	13,862	100.0 %
rls	5,118	8,015	16,811	21,852	24,621	100.0 %
ea-10p1	32,567	34,904	39,334	42,730	45,869	100.0 %
pbil	62,521	70,371	71,776	76,118	80,962	100.0 %
ga	23,262	27,195	89,687	117,401	194,344	0.0 %



4 Function ridge

Algorithm	Number of evaluations					Success
	min	Q_1	med.	Q_3	max	
hc	14,301	14,626	15,151	15,601	15,901	100.0 %
ea-1p1	14,893	15,605	16,695	17,660	19,669	100.0 %
ea-1p10	14,413	17,713	19,100	19,733	20,154	100.0 %
sa	20,900	23,459	24,970	26,306	28,254	100.0 %
umda	42,762	48,066	49,203	49,651	52,333	100.0 %
ea-10p1	144,135	158,402	172,021	176,815	190,317	100.0 %
ga	6,568	22,937	47,115	113,364	198,529	0.0 %
rls	8,983	16,547	62,558	129,629	187,680	0.0 %
pbil	194,978	195,217	196,241	198,391	199,963	0.0 %



A Plan

```
{
  "exec": "hnco",
  "opt": "--print-results --map 1 --map-random -s 100",
  "budget": 200000,
  "num_runs": 10,
  "parallel": true,
  "functions": [
    {
      "id": "one-max",
      "opt": "-F 0 --stop-on-maximum"
    },
    {
      "id": "leading-ones",
      "opt": "-F 10 --stop-on-maximum"
    },
    {
      "id": "ridge",
      "opt": "-F 11 --stop-on-maximum"
    }
  ],
  "algorithms": [
    {
      "id": "rls",
      "opt": "-A 100 --restart"
    },
    {
      "id": "hc",
      "opt": "-A 150 --restart"
    }
  ]
}
```

```

    },
    {
        "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": "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
# rep_categorical_representation = 0
# 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 = 0.16
# Generated from hnco.json
```