HNCO
Fixed target analysis

February 3, 2021

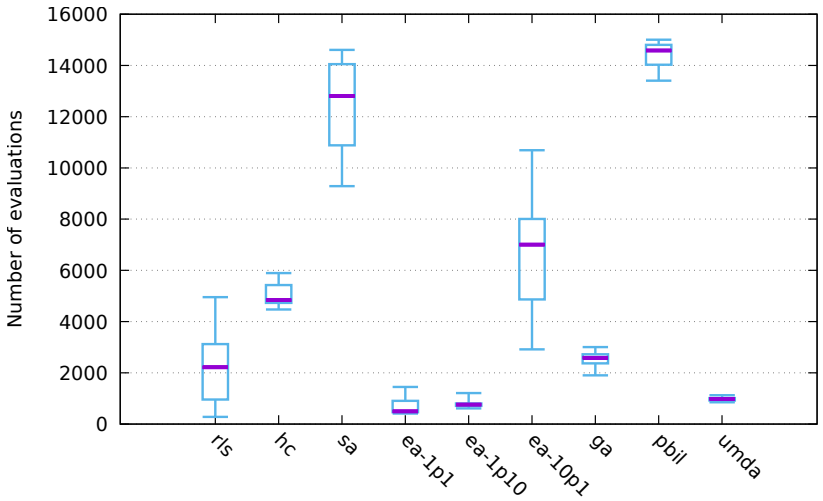
Contents

1 Global results

Algorithm	Rank					Success
	min	Q_1	med.	Q_3	max	
hc	1	1.00	1.0	3.50	6	100.0 %
ea-1p1	1	1.50	2.0	2.50	3	100.0 %
ea-1p10	2	2.50	3.0	3.50	4	100.0 %
sa	2	3.00	4.0	6.00	8	100.0 %
umda	3	4.00	5.0	5.00	5	100.0 %
ea-10p1	6	6.50	7.0	7.00	7	100.0 %
rls	4	5.00	6.0	7.00	8	66.0 %
pbil	8	8.50	9.0	9.00	9	66.0 %
ga	5	6.00	7.0	8.00	9	33.0 %

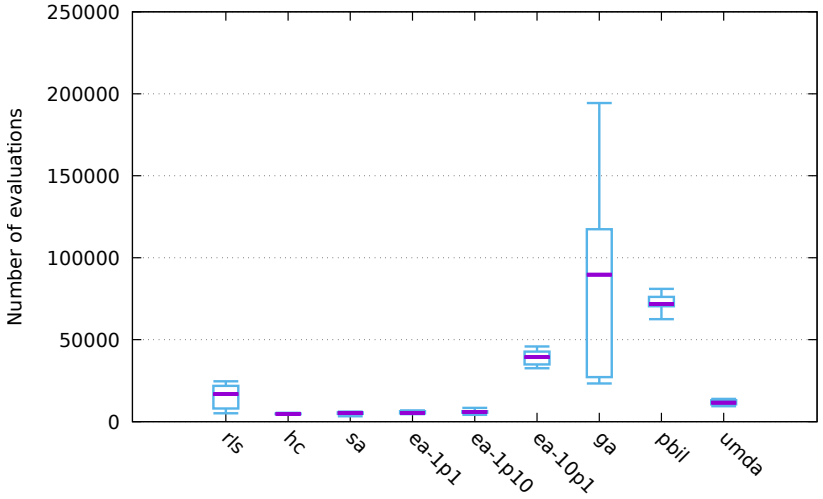
2 Function one-max

Algorithm	Number of evaluations					Success
	min	Q_1	med.	Q_3	max	
ea-1p1	409	463.25	497.0	904.50	1,450	100.0 %
ea-1p10	611	712.75	762.0	803.50	1,212	100.0 %
umda	849	921.00	980.5	1,015.00	1,125	100.0 %
rls	281	959.50	2,213.5	3,124.25	4,953	100.0 %
ga	1,902	2,369.25	2,588.5	2,725.25	3,006	100.0 %
hc	4,473	4,731.50	4,836.0	5,427.50	5,893	100.0 %
ea-10p1	2,916	4,866.50	7,005.0	8,005.75	10,692	100.0 %
sa	9,288	10,882.25	12,801.0	14,048.75	14,608	100.0 %
pbil	13,407	14,028.75	14,585.5	14,805.25	15,005	100.0 %



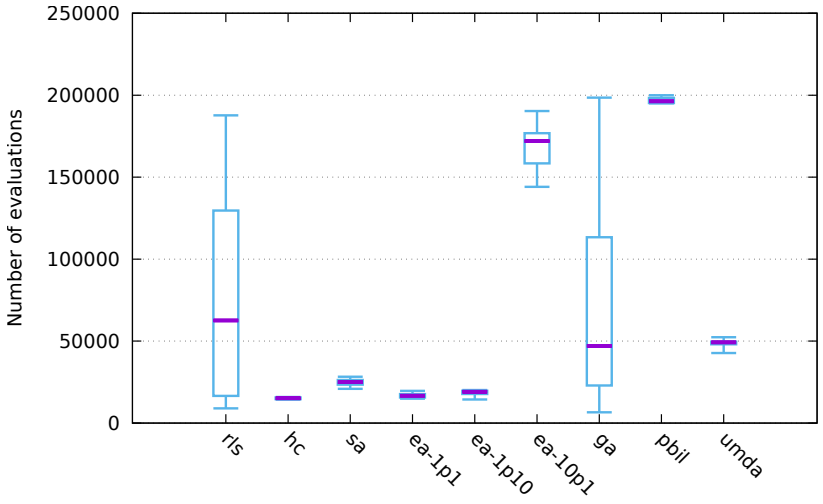
3 Function leading-ones

Algorithm	Number of evaluations					Success
	min	Q_1	med.	Q_3	max	
hc	4,398	4,626.00	4,751.0	4,900.75	5,398	100.0 %
sa	3,281	4,714.25	5,248.0	5,620.00	6,111	100.0 %
ea-1p1	4,636	5,028.75	5,394.0	6,360.75	6,880	100.0 %
ea-1p10	4,184	5,443.75	6,023.5	6,356.50	8,378	100.0 %
umda	9,426	10,577.00	11,585.0	13,052.75	13,862	100.0 %
rls	5,118	8,015.75	16,811.0	21,852.50	24,621	100.0 %
ea-10p1	32,567	34,904.75	39,334.0	42,730.25	45,869	100.0 %
pbil	62,521	70,371.00	71,776.5	76,118.50	80,962	100.0 %
ga	23,262	27,195.00	89,687.5	117,401.00	194,344	0.0 %



4 Function ridge

Algorithm	Number of evaluations					Success
	min	Q_1	med.	Q_3	max	
hc	14,301	14,626.00	15,151.0	15,601.00	15,901	100.0 %
ea-1p1	14,893	15,605.25	16,695.5	17,660.50	19,669	100.0 %
ea-1p10	14,413	17,713.75	19,100.0	19,733.00	20,154	100.0 %
sa	20,900	23,459.00	24,970.5	26,306.25	28,254	100.0 %
umda	42,762	48,066.25	49,203.0	49,651.50	52,333	100.0 %
ea-10p1	144,135	158,402.75	172,021.5	176,815.50	190,317	100.0 %
ga	6,568	22,937.75	47,115.5	113,364.00	198,529	0.0 %
rls	8,983	16,547.50	62,558.0	129,629.25	187,680	0.0 %
pbil	194,978	195,217.75	196,241.0	198,391.25	199,963	0.0 %



A Plan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{
    "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
```