

HNCO

Fixed target analysis

October 25, 2020

Contents

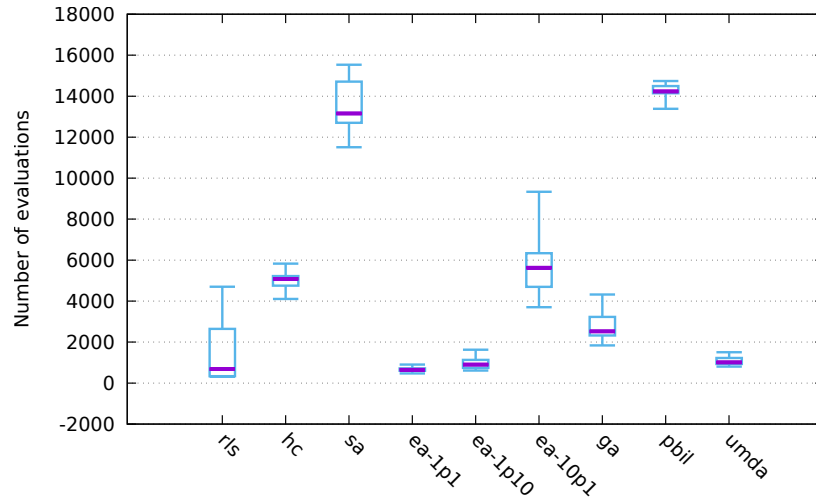
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1 Global results

Algorithm	Rank distribution									Success
	1	2	3	4	5	6	7	8	9	
ea-1p1	1	2	0	0	0	0	0	0	0	100.0 %
hc	1	0	1	0	0	1	0	0	0	100.0 %
sa	1	0	0	1	0	0	0	1	0	100.0 %
ea-1p10	0	0	2	1	0	0	0	0	0	100.0 %
umda	0	0	0	1	2	0	0	0	0	100.0 %
rls	0	1	0	0	0	1	1	0	0	66.0 %
ea-10p1	0	0	0	0	0	0	2	0	1	66.0 %
pbil	0	0	0	0	0	0	0	2	1	66.0 %
ga	0	0	0	0	1	1	0	0	1	36.0 %

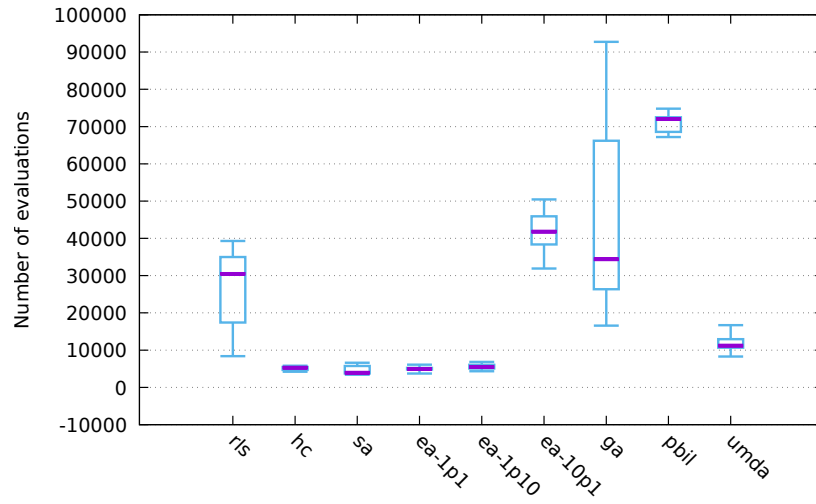
2 Function one-max

Algorithm	Number of evaluations						
	min	Q_1	med.	Q_3	max	success	rk
rls	305	339	682	2,647	4,702	100.0 %	2
hc	4,103	4,757	5,085	5,221	5,830	100.0 %	6
sa	11,510	12,701	13,156	14,708	15,537	100.0 %	8
ea-1p1	473	600	650	718	905	100.0 %	1
ea-1p10	610	740	907	1,133	1,628	100.0 %	3
ea-10p1	3,705	4,699	5,632	6,340	9,337	100.0 %	7
ga	1,837	2,326	2,523	3,231	4,322	100.0 %	5
pbil	13,387	14,145	14,233	14,493	14,737	100.0 %	9
umda	802	930	1,009	1,223	1,504	100.0 %	4



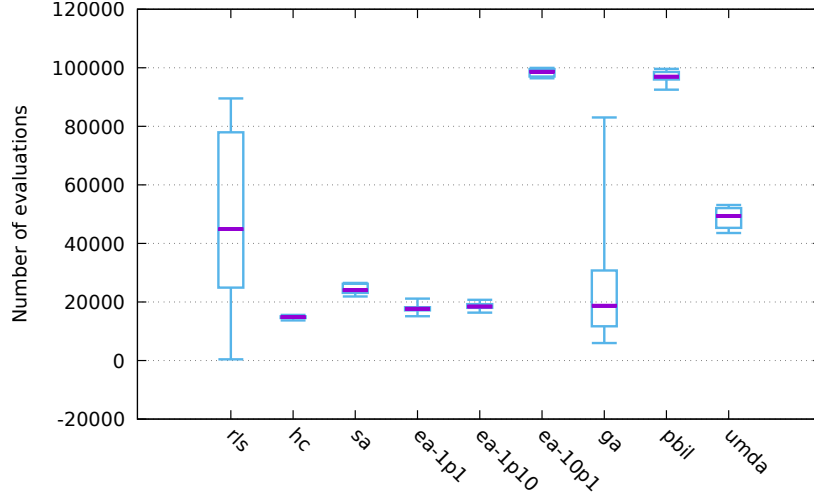
3 Function leading-ones

Algorithm	Number of evaluations						
	min	Q_1	med.	Q_3	max	success	rk
rls	8,388	17,396	30,475	35,004	39,305	100.0 %	6
hc	4,201	4,674	5,300	5,501	5,801	100.0 %	3
sa	3,393	3,756	3,954	5,735	6,611	100.0 %	1
ea-lp1	3,737	4,823	4,934	5,231	6,115	100.0 %	2
ea-lp10	4,342	5,081	5,456	6,061	6,829	100.0 %	4
ea-10p1	31,915	38,357	41,809	45,932	50,434	100.0 %	7
ga	16,567	26,353	34,388	66,184	92,750	10.0 %	9
pbil	67,177	68,582	71,968	72,487	74,794	100.0 %	8
umda	8,275	10,678	11,209	12,933	16,698	100.0 %	5



4 Function ridge

Algorithm	Number of evaluations						
	min	Q_1	med.	Q_3	max	success	rk
rls	427	24,928	44,874	77,967	89,541	0.0 %	7
hc	13,701	14,526	14,801	15,076	15,601	100.0 %	1
sa	21,898	23,102	24,010	26,199	26,486	100.0 %	4
ea-1p1	15,132	17,134	17,728	18,181	21,164	100.0 %	2
ea-1p10	16,347	17,992	18,452	19,270	20,752	100.0 %	3
ea-10p1	96,413	96,999	98,650	99,547	99,939	0.0 %	9
ga	5,958	11,681	18,737	30,747	83,033	0.0 %	6
pbil	92,512	96,006	98,981	98,567	99,646	0.0 %	8
umda	43,560	45,301	49,426	52,051	53,122	100.0 %	5



A Plan

```
{
  "exec": "hnco",
  "opt": "--print-results --map 1 --map-random -s 100",
  "budget": 100000,
  "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
```