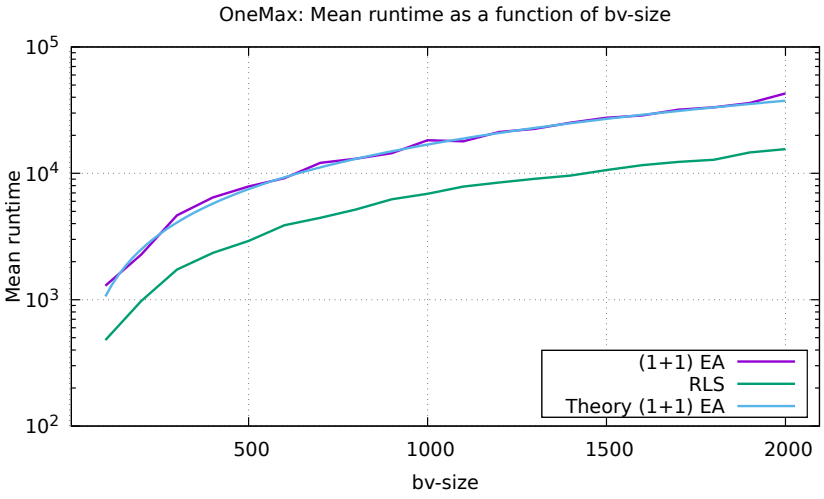
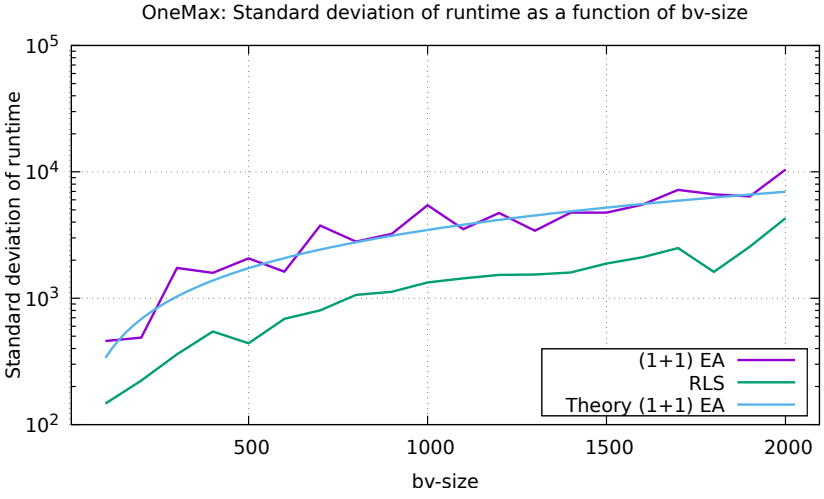
HNCO
Runtime as a function of size of (1+1) EA and RLS on OneMax and LeadingOnes

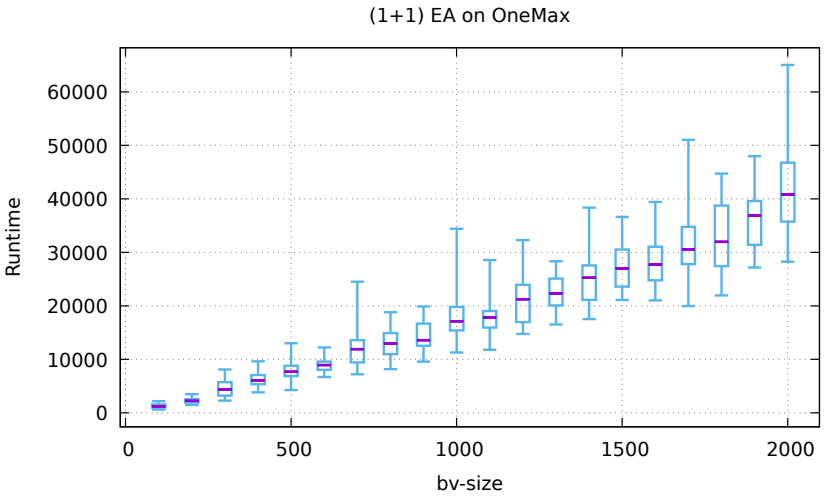
August 2, 2019

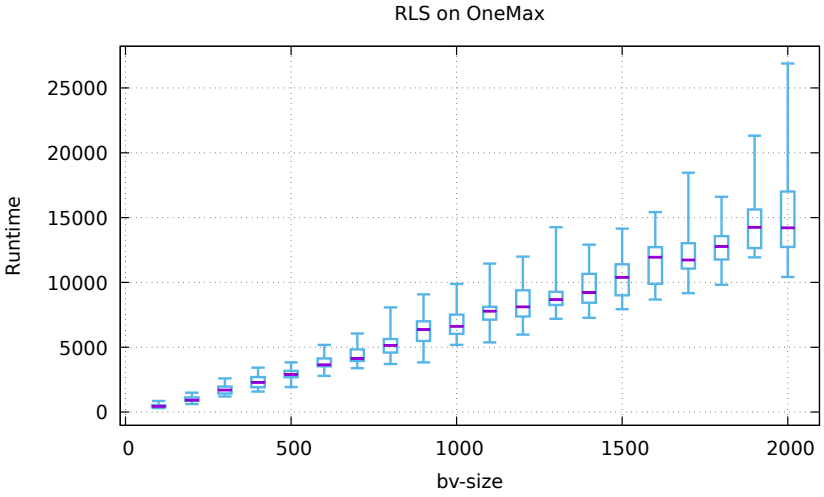
Contents

1 Function OneMax

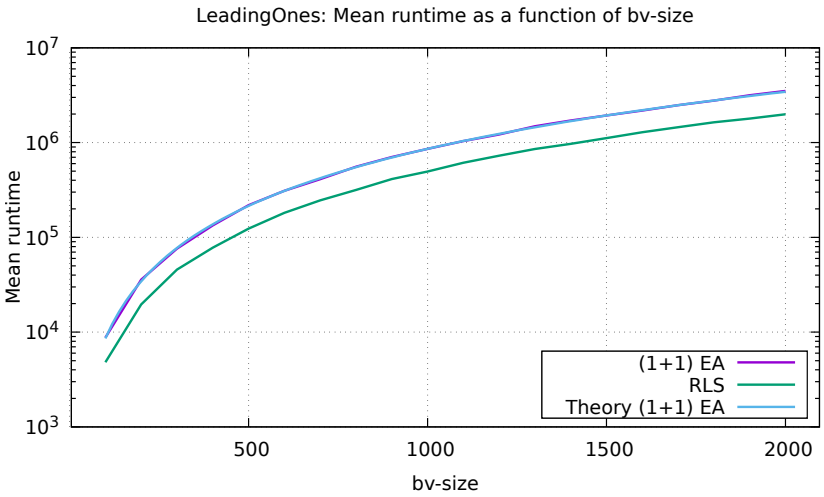


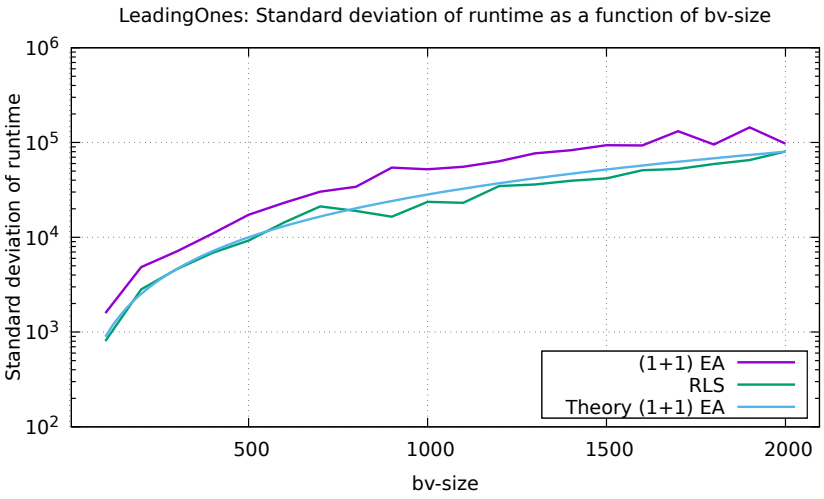


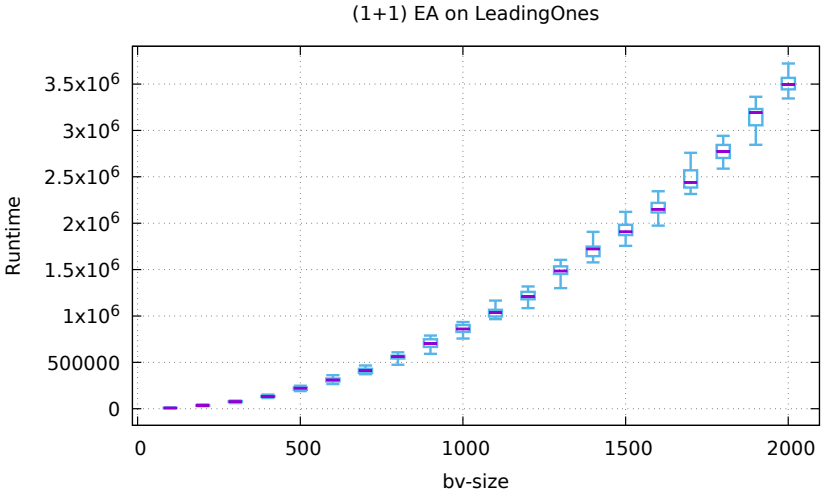


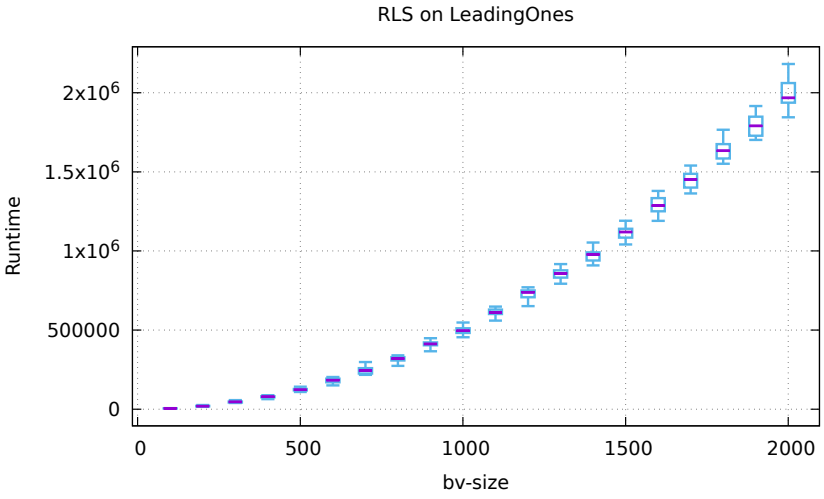


2 Function LeadingOnes









A Plan

```
{
    "exec": "hnco",
    "opt": "--print-results --stop-on-maximum",
    "budget": 0,
    "num_runs": 20,
    "parallel": true,
    "parameter": {
        "id": "bv-size",
        "values_perl": "map { 100 + 100 * $_ } (0 .. 19)",
```

```
        "boxwidth": "40"
    },
    "functions": [
        {
            "id": "one-max",
            "name": "OneMax",
            "opt": "-F 0",
            "mean_gnuplot": [
                {
                    "expression": "f(x) = exp(1) * (x + 1/2) * log(x) - 1.8925417883 * x",
                    "title": "Theory (1+1) EA"
                }
            ],
            "stddev_gnuplot": [
                {
                    "expression": "f(x) = sqrt(pi**2 / 6 * (exp(1) * x)**2 - (2 * exp(1) + 1) * exp(1)
                    ↪  * x * log(x))",
                    "title": "Theory (1+1) EA"
                }
            ]
        },
        {
            "id": "leading-ones",
            "name": "LeadingOnes",
            "opt": "-F 10",
            "mean_gnuplot": [
                {
                    "expression": "f(x) = (exp(1) - 1) / 2 * x**2",
                    "title": "Theory (1+1) EA"
                }
            ],
            "stddev_gnuplot": [
                {
                    "expression": "f(x) = sqrt((exp(2) - 1) / 8 * x**3)",
                    "title": "Theory (1+1) EA"
                }
            ]
        }
    ],
    "algorithms": [
        {
            "id": "ea-1p1",
            "name": "(1+1) EA",
            "opt": "-A 300 --allow-stay"
        },
        {
            "id": "rls",
            "name": "RLS",
            "opt": "-A 100 --rls-patience 0"
        }
    ]
}
```

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_sequence_length = 10
# 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 = 0.13
# Generated from hnco.json
```