

BornAgain - Refactoring #2376

Fit: Look for an alternative to root minimizers

05 Jun 2019 13:14 - dmitry

Status:	Long Term Idea	Start date:	05 Jun 2019
Priority:	Normal	Due date:	
Assignee:		% Done:	0%
Category:		Estimated time:	0.00 hour
Target version:			
Description			
Root library covers lots of very different minimizers under one umbrella. However it lacks some modern minimizers (e.g. differential evolution) which could be handy. Besides it costs big efforts to support the interfacing and bring all the minimizers to stable functioning.			
I would give a try to OptimLib			

History

#1 - 12 Jun 2019 11:59 - juan

In this page (<https://en.cppreference.com/w/cpp/links/libs>) there's a gazillion of c++ libraries, not all of which are interesting. Going to the 'optimization' section, the only entry is OptimLib; however, dlib' --listed under 'Generic', 'Linear Algebra' and 'Image Processing', offers several optimization functionalities with many examples for both Python and C++ I'd say it is worth taking a closer look at it (<http://dlib.net/optimization.html>):

General Purpose Optimizers:

```
find_max
  find_max_bobyqa
  find_max_box_constrained
  find_max_global
  find_max_single_variable
  find_max_trust_region
  find_max_using_approximate_derivatives
find_min
  find_min_bobyqa
  find_min_box_constrained
  find_min_global
  find_min_single_variable
  find_min_trust_region
  find_min_using_approximate_derivatives
global_function_search
```

Special Purpose Optimizers:

```
elastic_net
  find_gap_between_convex_hulls
  find_max_factor_graph_nmplp
  find_max_factor_graph_potts
  find_max_factor_graph_viterbi
  find_max_parse_cky
  isotonic_regression
  max_cost_assignment
  max_sum_submatrix
  min_cut
  mpc
  oca
  solve_least_squares
  solve_least_squares_lm
  solve_qp2_using_smo
  solve_qp3_using_smo
  solve_qp4_using_smo
  solve_qp_box_constrained
  solve_qp_box_constrained_blockdiag
```

```
solve_qp_using_smo
solve_trust_region_subproblem
solve_trust_region_subproblem_bounded
```

Strategies:

```
bfgs_search_strategy
cg_search_strategy
gradient_norm_stop_strategy
lbfgs_search_strategy
newton_search_strategy
objective_delta_stop_strategy
```

Both Dlib and OptimLib are opensource projects and have github repositories:

<https://github.com/kthohr/optim/> ; 1 contributor; lastest commit (as of today) in 2018; Apache Version 2 License
<https://github.com/davisking/dlib> ; 124 contributors; latest commit (as of today) in June 2019; Boost Software License

#2 - 30 Jul 2019 16:34 - pospelov

- *Target version deleted (v2.0)*

#3 - 24 Jun 2020 15:24 - wuttke

- *Status changed from Backlog to Long Term Idea*

#4 - 18 Sep 2020 23:01 - wuttke

- *Subject changed from Look for an alternative to root minimizers to Fit: Look for an alternative to root minimizers*