

Description of pfolio

Olivier Roussel
CRIL - CNRS UMR 8188
rue de l'Université, SP 16, 62 307 Lens Cedex, France
olivier.roussel@cril.univ-artois.fr

pfolio (Pico Portfolio or also Parallel Portfolio) is a naive parallel portfolio. It is meant to identify a lower bound of what can be achieved either with portfolios, or with parallel solvers.

pfolio by itself is just a program that starts SAT solvers in parallel. It only involves system programming and knows nothing about the SAT problem. The number of cores that may be used can be selected on the command line.

pfolio does not try to be clever in any way. Its role is just to run solvers in parallel. Several obvious improvements are possible (detecting the type of SAT instance and choosing the appropriate solver, improving the scheduling of the solvers, sharing of the formula,...) but were not considered because the goal of this solver is uniquely to identify a lower bound of the performances that can be achieved using a few lines of plain system programming. It is of course expected that access to main memory will be a bottleneck that will significantly impact each individual solver performances.

The submitted version uses the following solvers

- cryptominisat (Mate Soos)
- lingeling/plingeling (Armin Biere)
- clasp (Martin Gebser, Benjamin Kaufmann, and Torsten Schaub)
- TNM (Wanxia Wei and Chu Min Li)
- march_hi (Marijn Heule and Hans Van Maaren)

These solvers have been chosen on the basis of their results on the 2009 competition benchmark. In each category (application, crafted, random), the best solver was selected. A second solver was also selected if it could solve at least ten instances than the first solver didn't.

The solvers that are started depend on the number of allocated cores :

- 1 core: cryptominisat, clasp and TNM are started, but since there is only one core, the solver is essentially sequential.
- 2 cores: cryptominisat and lingeling are started on the first core, clasp and TNM on the second core

- 3 cores: cryptominisat and lingeling are started on their own core, clasp and TNM on the last core
- 4 cores: cryptominisat, lingeling and clasp are started on their own core. TNM and march_hi are run on the remaining core.
- 5 cores: cryptominisat, lingeling, clasp, TNM and march_hi are started on their own core.
- >5 cores: cryptominisat, clasp, TNM and march_hi are started on their own core. plingeling is run on the remaining cores.