Figure 1: timing-pattern

1

The chart contains the following legend entries:

- abstract-real
  $2.01 \cdot 10^{-9} \cdot x^2 + 1.54 \cdot 10^{-4} \cdot$
- abstract-user
  $1.63 \cdot 10^{-9} \cdot x^2 + 1.53 \cdot 10^{-4} \cdot$
- close-abstract-real
  $1.88 \cdot 10^{-9} \cdot x^2 + 1.06 \cdot 10^{-4} \cdot$
- close-abstract-user
  $1.66 \cdot 10^{-9} \cdot x^2 + 1.04 \cdot 10^{-4} \cdot$
- exact-real
  $4.98 \cdot 10^{-5} \cdot x - 3.39$
- exact-user
  $4.79 \cdot 10^{-5} \cdot x - 2.58$
- abstract-sys
- close-abstract-sys
- exact-sys

Axis labels: time (s) (vertical), 0-univ-count (horizontal)

Figure 2: timing-n-polymorphic-universes param-1-n 0

time (s)

80

70

60

50

40

30

20

10

0

0   50   100   150   200   250   300   350   400

n

repeat-setoid

$1.32 \cdot 10^{-6} \cdot x^3 + 3.49 \cdot 10^{-7} \cdot x$

repeat-setoid

$1.32 \cdot 10^{-6} \cdot x^3 + 1.37 \cdot 10^{-6} \cdot$

abstract+setc

$6.9 \cdot 10^{-7} \cdot x^3 + 2.6 \cdot 10^{-6} \cdot x^2$

abstract+setc

$6.88 \cdot 10^{-7} \cdot x^3 + 3.74 \cdot 10^{-6} \cdot$

setoid-re

$6.96 \cdot 10^{-7} \cdot x^3 - 1.62 \cdot 10^{-5} \cdot$

setoid-re

$6.93 \cdot 10^{-7} \cdot x^3 - 1.51 \cdot 10^{-5} \cdot$

noop-try-seto

$6.2 \cdot 10^{-7} \cdot x^3 + 1.62 \cdot 10^{-5} \cdot x$

noop-try-seto

$6.2 \cdot 10^{-7} \cdot x^3 + 1.59 \cdot 10^{-5} \cdot x$

noop-repeat-se

$6.26 \cdot 10^{-7} \cdot x^3 + 1.36 \cdot 10^{-5} \cdot$

noop-repeat-se

$6.26 \cdot 10^{-7} \cdot x^3 + 1.37 \cdot 10^{-5} \cdot$

close-abstract+s

$1.58 \cdot 10^{-5} \cdot x^2 + 2.65$

close-abstract+s

$1.58 \cdot 10^{-5} \cdot x^2 + 2.67$

setoid-re

repeat-setoi

abstract+setc

noop-try-seto

noop-repeat-se

close-abstract+s

Figure 3: timing-repeat-setoid-rewrite-under-binders
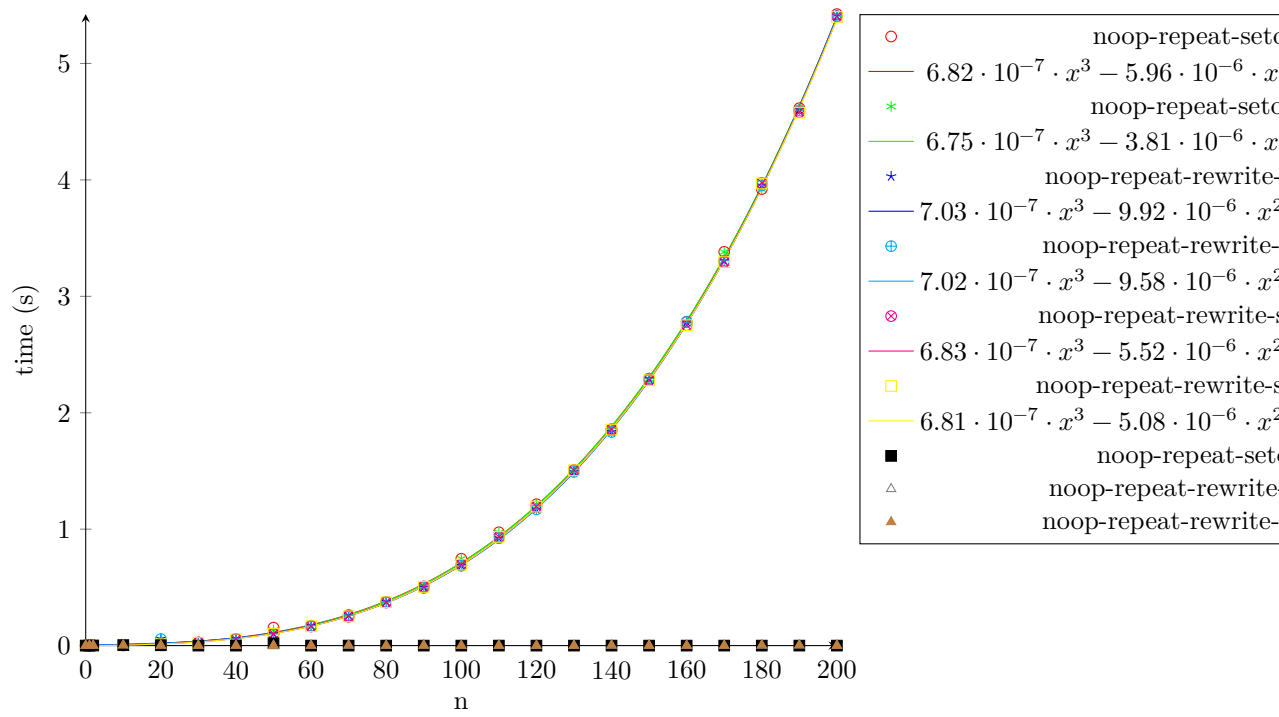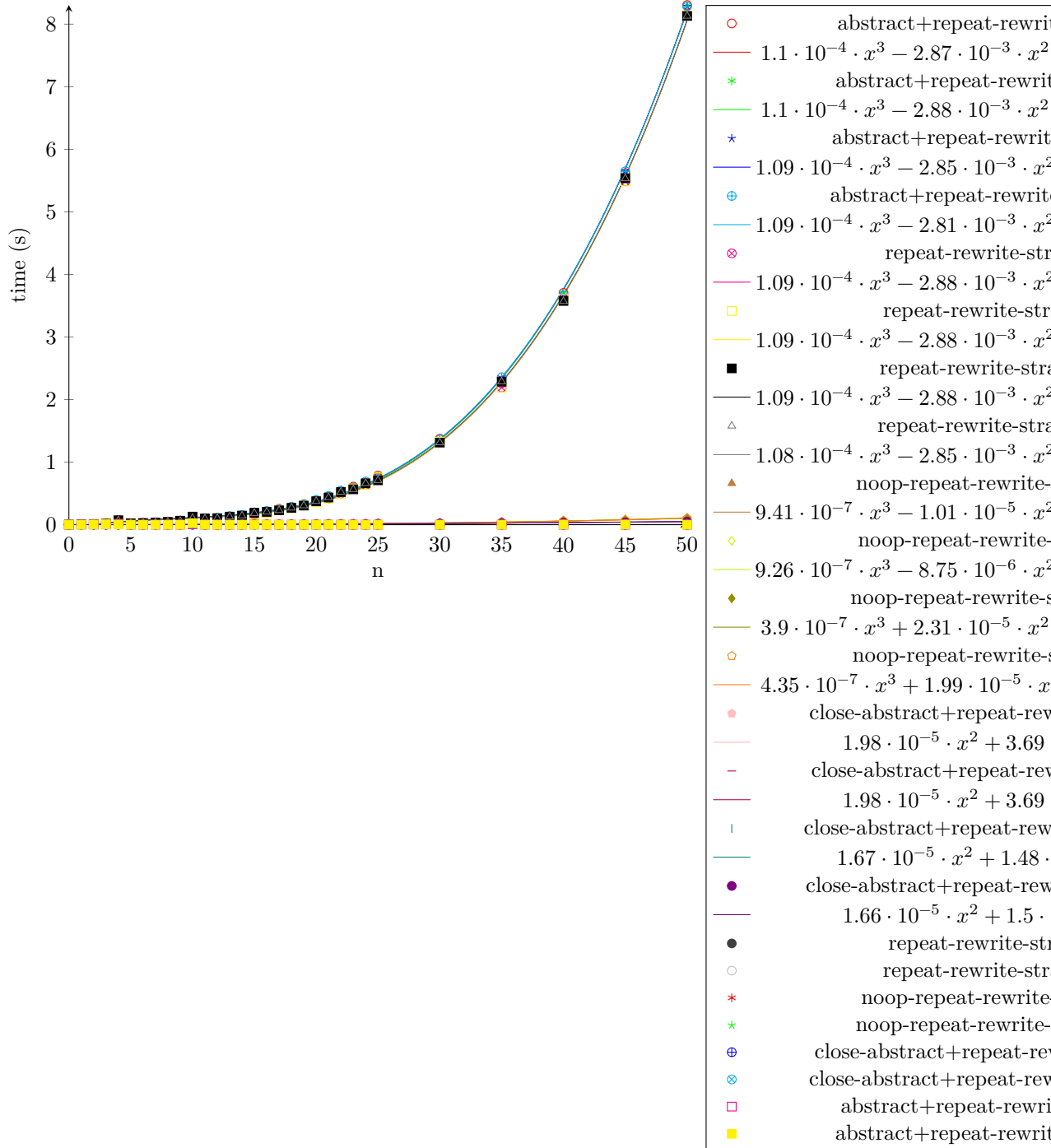
Figure 4: timing-repeat-setoid-rewrite-under-binders-noop
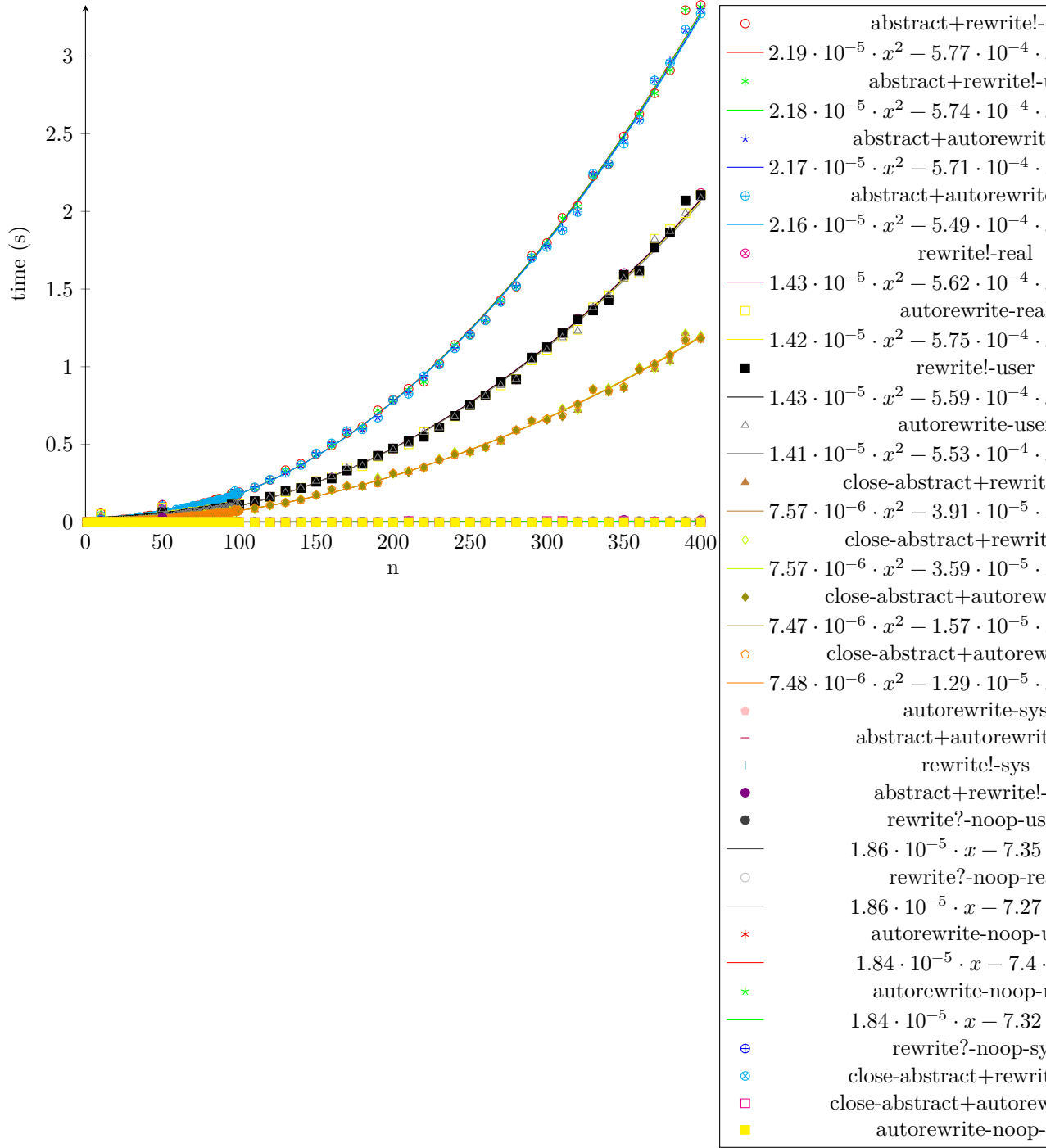
Figure 5: timing-rewrite-strat-under-binders

5

time (s)

n

abstract+rewrite!-
$2.19 \cdot 10^{-5} \cdot x^2 - 5.77 \cdot 10^{-4} \cdot$
abstract+rewrite!-u
$2.18 \cdot 10^{-5} \cdot x^2 - 5.74 \cdot 10^{-4} \cdot$
abstract+autorewrit
$2.17 \cdot 10^{-5} \cdot x^2 - 5.71 \cdot 10^{-4} \cdot$
abstract+autorewrit
$2.16 \cdot 10^{-5} \cdot x^2 - 5.49 \cdot 10^{-4} \cdot$
rewrite!-real
$1.43 \cdot 10^{-5} \cdot x^2 - 5.62 \cdot 10^{-4} \cdot$
autorewrite-rea
$1.42 \cdot 10^{-5} \cdot x^2 - 5.75 \cdot 10^{-4} \cdot$
rewrite!-user
$1.43 \cdot 10^{-5} \cdot x^2 - 5.59 \cdot 10^{-4} \cdot$
autorewrite-use
$1.41 \cdot 10^{-5} \cdot x^2 - 5.53 \cdot 10^{-4} \cdot$
close-abstract+rewrit
$7.57 \cdot 10^{-6} \cdot x^2 - 3.91 \cdot 10^{-5} \cdot$
close-abstract+rewrit
$7.57 \cdot 10^{-6} \cdot x^2 - 3.59 \cdot 10^{-5} \cdot$
close-abstract+autorew
$7.47 \cdot 10^{-6} \cdot x^2 - 1.57 \cdot 10^{-5} \cdot$
close-abstract+autorew
$7.48 \cdot 10^{-6} \cdot x^2 - 1.29 \cdot 10^{-5} \cdot$
autorewrite-sys
abstract+autorewrit
rewrite!-sys
abstract+rewrite!-
rewrite?-noop-us
$1.86 \cdot 10^{-5} \cdot x - 7.35$
rewrite?-noop-re
$1.86 \cdot 10^{-5} \cdot x - 7.27$
autorewrite-noop-u
$1.84 \cdot 10^{-5} \cdot x - 7.4 \cdot$
autorewrite-noop-r
$1.84 \cdot 10^{-5} \cdot x - 7.32$
rewrite?-noop-sy
close-abstract+rewrit
close-abstract+autorew
autorewrite-noop-

Figure 6: timing-rewrite-repeated-app-autorewrite

6

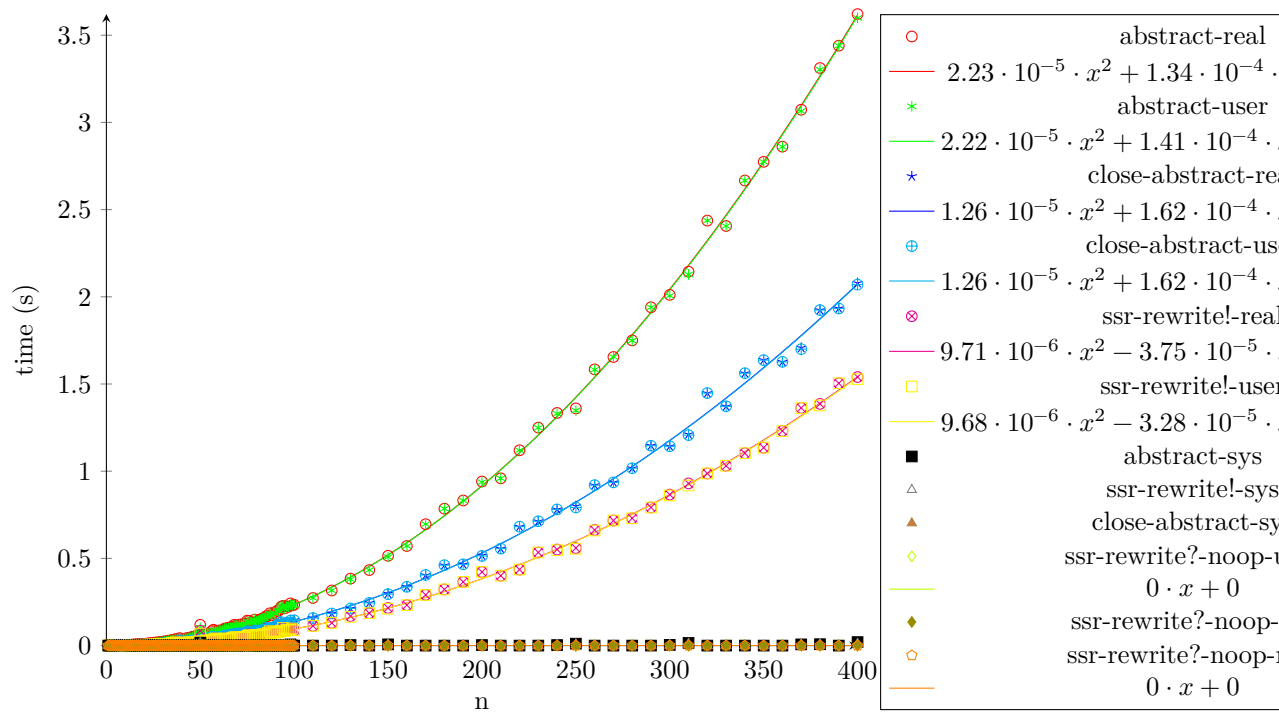Figure 7: timing-rewrite-repeated-app-autorewrite-noop
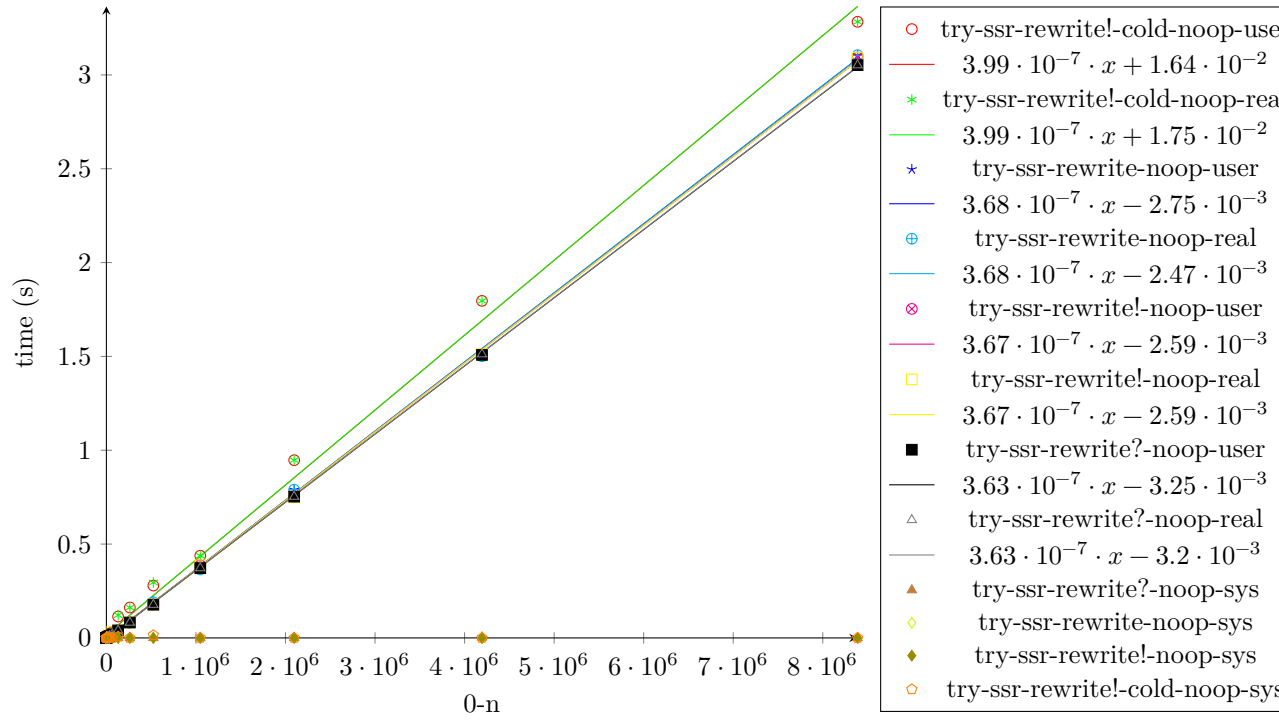
Figure 8: timing-rewrite-repeated-app-ssrrewrite

8
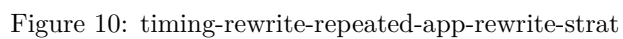
Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn 1

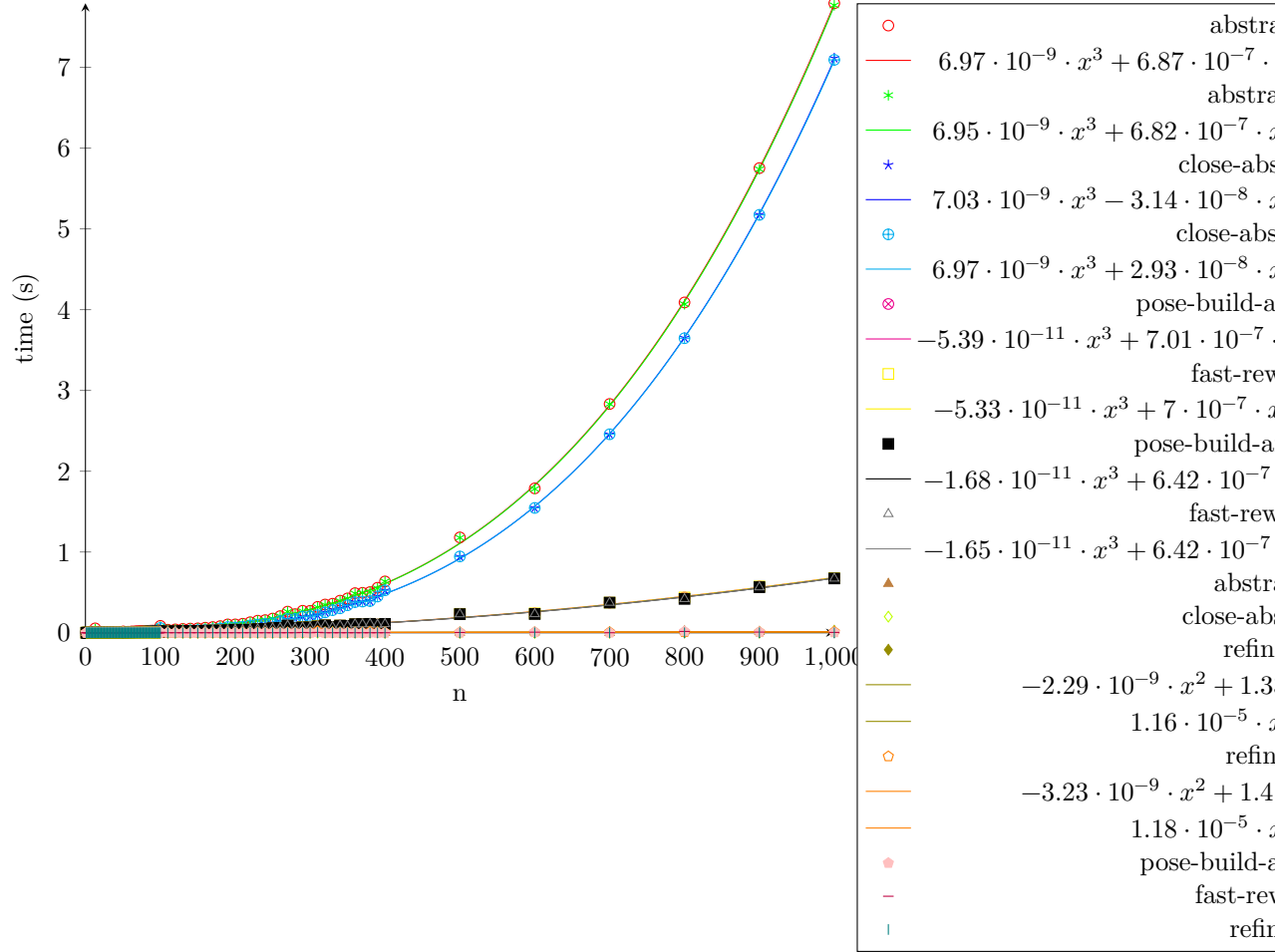Figure 10: timing-rewrite-repeated-app-rewrite-strat

The plot legend (partially cut off) includes the following entries:

- abstract+rewrite-strat-bottomu...
- abstract+rewrite-strat-bottomu...
- rewrite-strat-bottomup-rea...
- rewrite-strat-bottomup-use...
- abstract+rewrite-strat-topdow...
- abstract+rewrite-strat-topdow...
- rewrite-strat-topdown-rea...
- rewrite-strat-topdown-use...
- close-abstract+rewrite-strat-botto...
- close-abstract+rewrite-strat-botto...
- close-abstract+rewrite-strat-topd...
- close-abstract+rewrite-strat-topd...
- abstract+rewrite-strat-bottomu...
- rewrite-strat-bottomup-sy...
- abstract+rewrite-strat-topdow...
- rewrite-strat-topdown-noop-...
- rewrite-strat-topdown-noop-...
- rewrite-strat-topdown-sys...
- rewrite-strat-bottomup-noop-...
- rewrite-strat-bottomup-noop-...
- close-abstract+rewrite-strat-topd...
- rewrite-strat-topdown-noop-...
- rewrite-strat-bottomup-noop...
- close-abstract+rewrite-strat-botto...

Figure 11: timing-rewrite-repeated-app-fast-rewrite

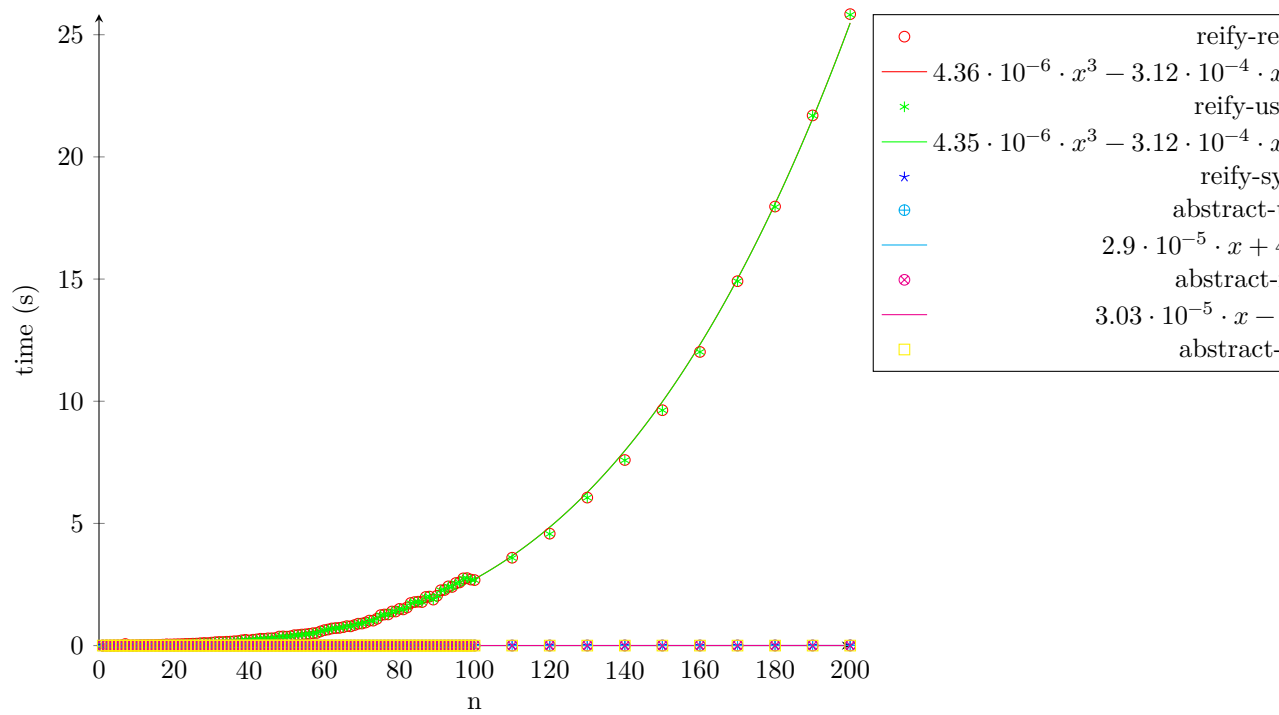Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract
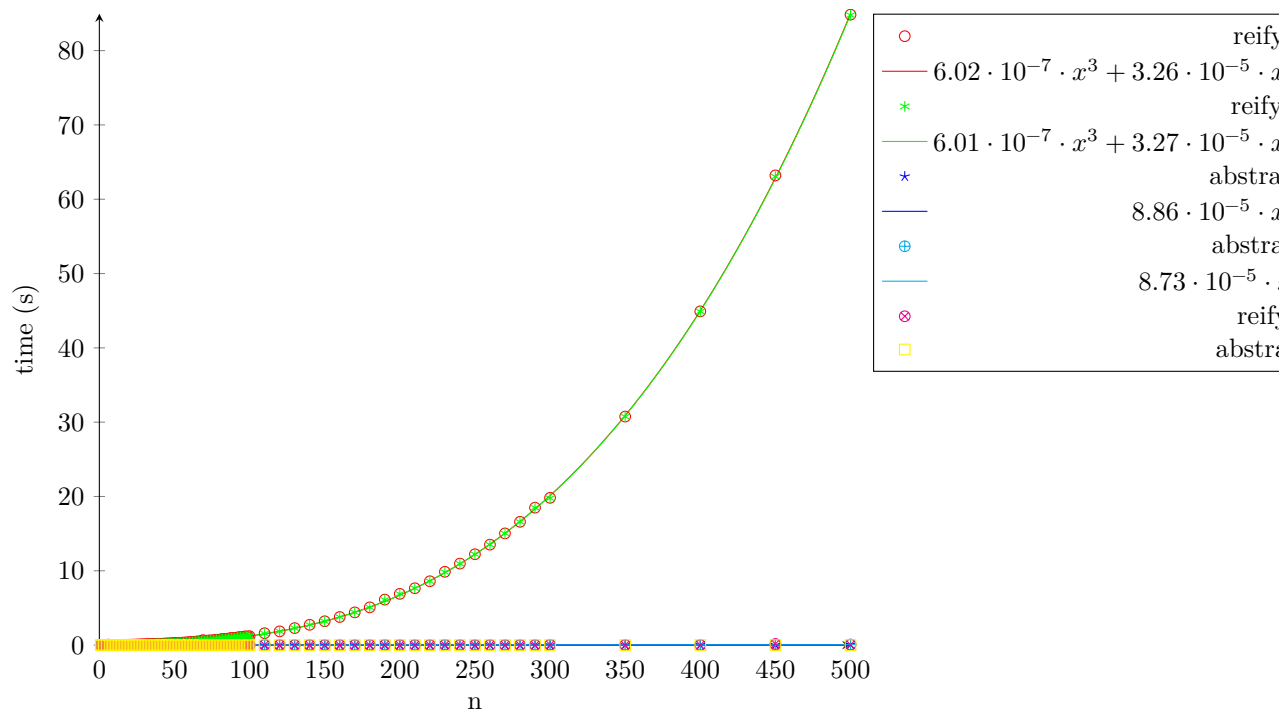
Figure 13: timing-typeclass-reification-let-in-HOAS

Figure 14: timing-typeclass-reification-let-in-PHOAS

time (s)

n