

Figure 1: timing-pattern

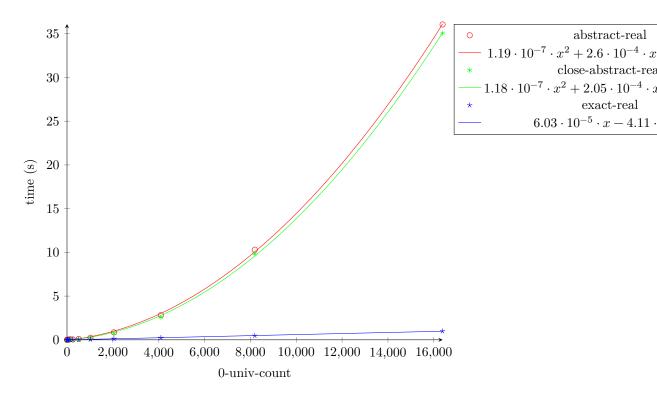
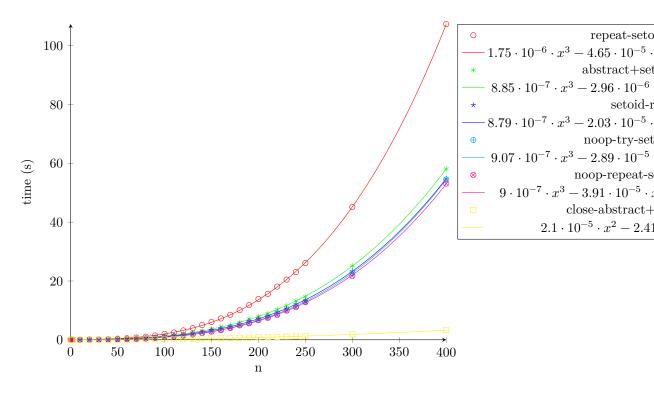
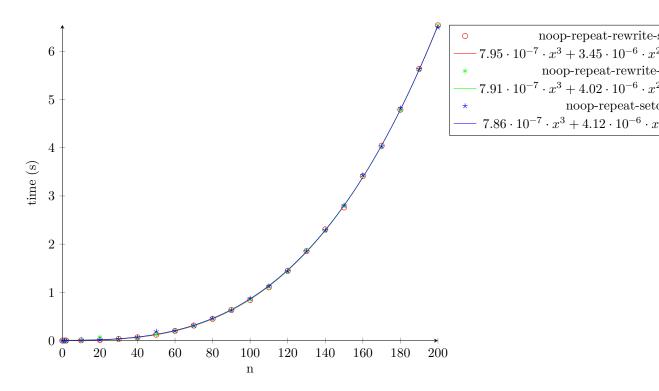


Figure 2: timing-n-polymorphic-universes param-1-n $\,0\,$



 $Figure \ 3: \ timing-repeat-setoid-rewrite-under-binders$



 $Figure\ 4:\ timing-repeat-setoid-rewrite-under-binders-noop$

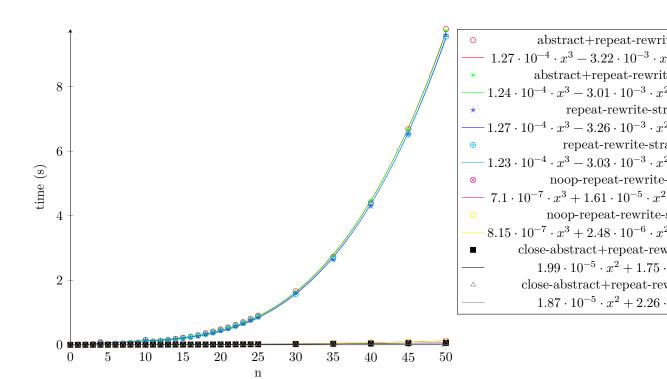
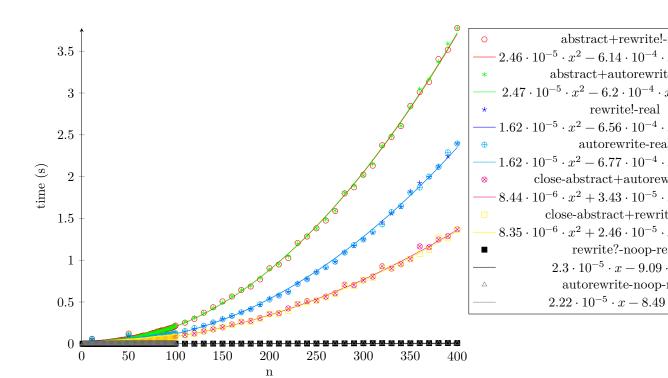
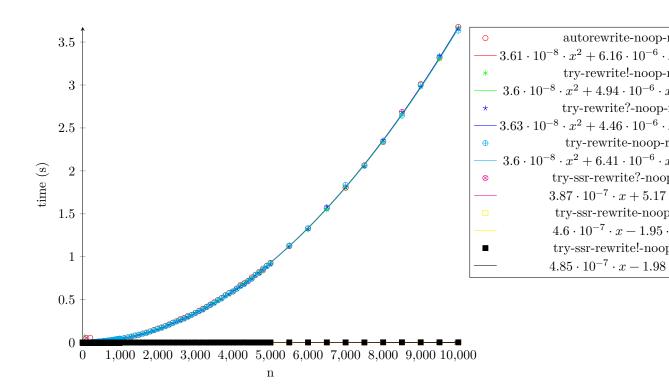


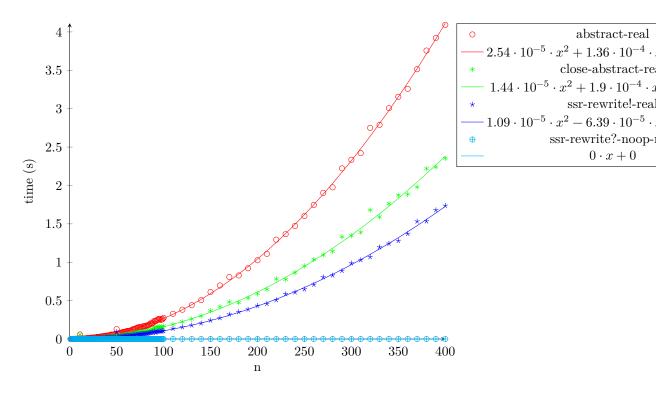
Figure 5: timing-rewrite-strat-under-binders



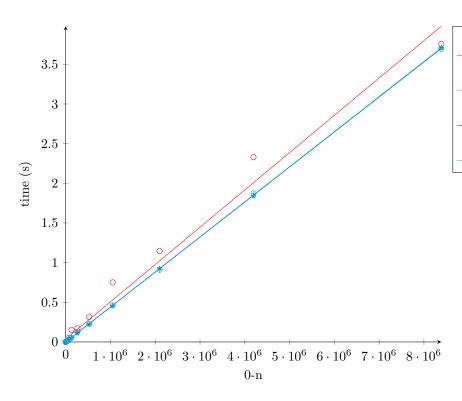
 $Figure \ 6: \ timing-rewrite-repeated-app-autorewrite \\$



 $Figure~7:~timing\mbox{-rewrite-repeated-app-autorewrite-noop}$



 ${\bf Figure~8:~timing\text{-}rewrite\text{-}repeated\text{-}app\text{-}ssrrewrite}$



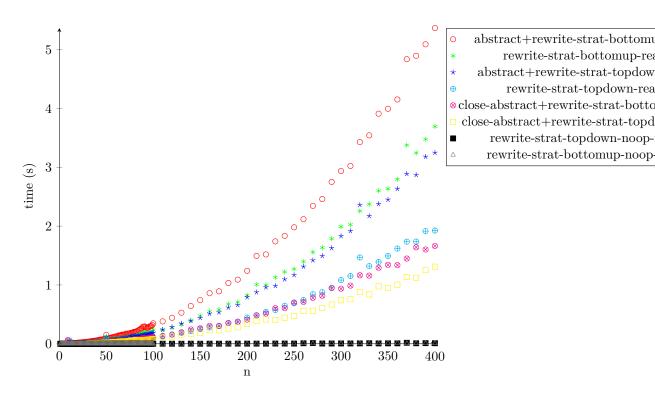
try-ssr-rewrite!-cold-noop-rea $4.7\cdot 10^{-7}\cdot x + 3.58\cdot 10^{-2}$

try-ssr-rewrite-noop-real $4.42\cdot 10^{-7}\cdot x - 1.58\cdot 10^{-3}$

try-ssr-rewrite?-noop-real $4.41\cdot 10^{-7}\cdot x - 1.5\cdot 10^{-3}$ try-ssr-rewrite!-noop-real

 $4.41\cdot 10^{-7}\cdot x + 1.05\cdot 10^{-3}$

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

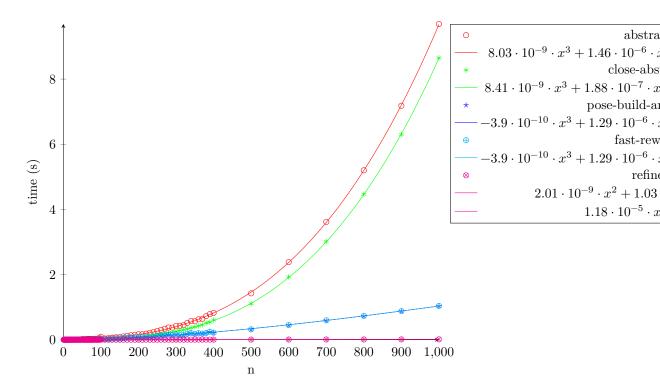


rewrite-strat-bottomup-rea

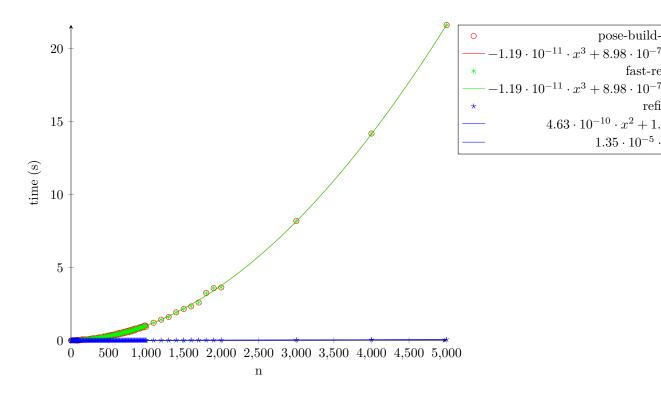
rewrite-strat-topdown-rea

rewrite-strat-topdown-noop-

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



 $Figure~11:~timing\mbox{-rewrite-repeated-app-fast-rewrite}$



 $Figure~12:~timing\mbox{-rewrite-repeated-app-fast-rewrite-no-abstract}$

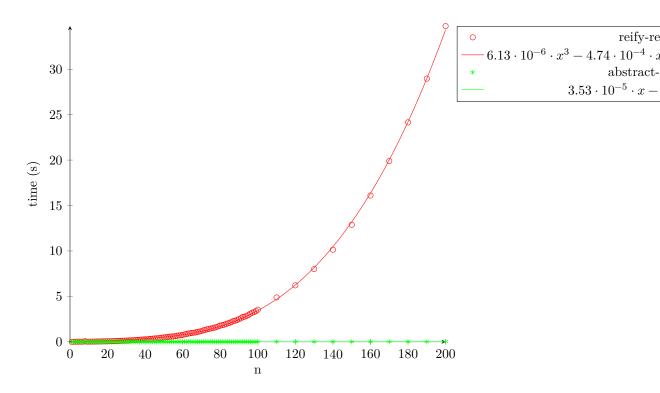


Figure 13: timing-typeclass-reification-let-in-HOAS

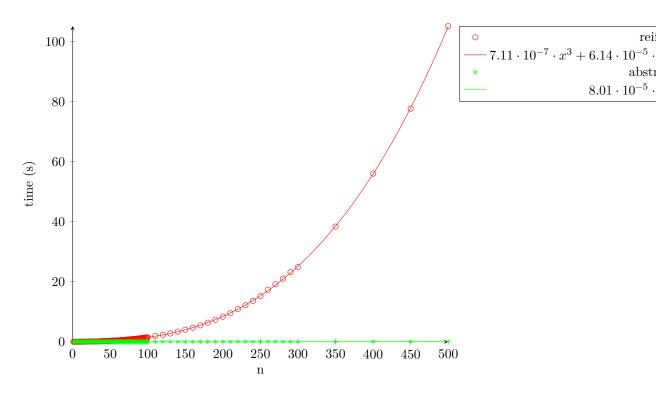


Figure 14: timing-typeclass-reification-let-in-PHOAS

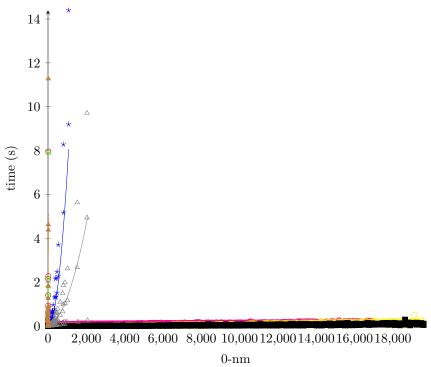
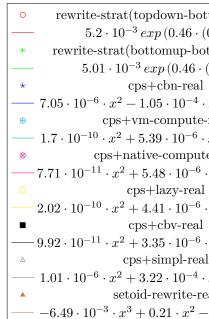


Figure 15: timing-rewrite-lift-lets-map param-1-n 1, param-2-m 1



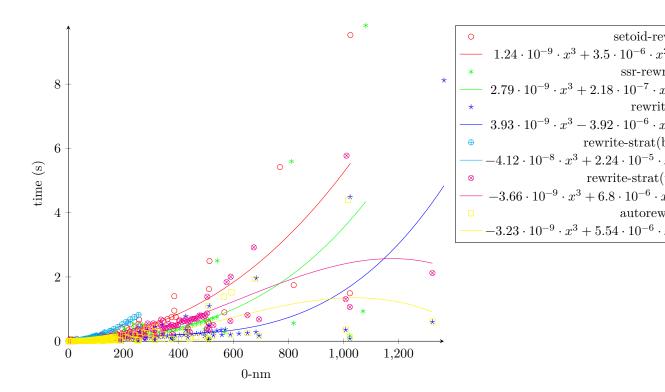
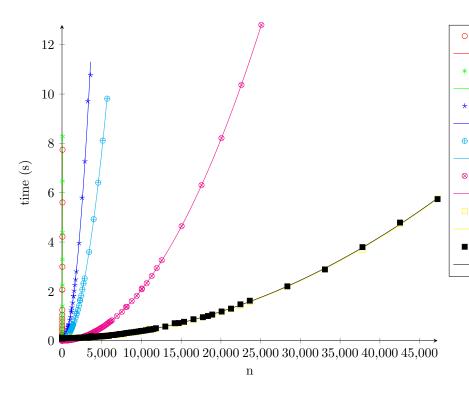


Figure 16: timing-rewrite-plus-0-tree param-1-n 0, param-2-m 1, param-3-input-size 5, param-4-output-size 3, param-5-num-rewrites 1



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 $1.95 \cdot 10^{-5} \cdot x^3 + 4.1 \cdot 10^{-4} \cdot x$

 $1.94 \cdot 10^{-5} \cdot x^3 + 3.08 \cdot 10^{-4} \cdot x^3$

 $8.77 \cdot 10^{-7} \cdot x^2 - 1.52$

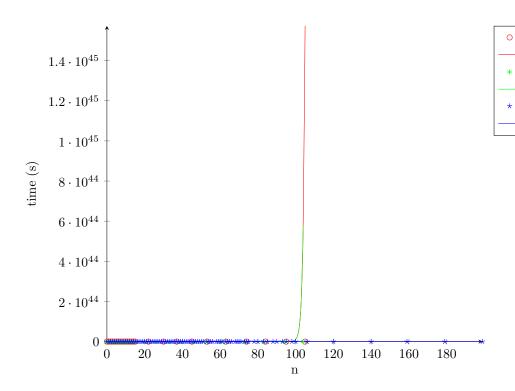
 $2.97 \cdot 10^{-7} \cdot x^2 + 4.74$

 $2.01 \cdot 10^{-8} \cdot x^2 + 5.9$

 $2.43 \cdot 10^{-9} \cdot x^2 + 4.55$

 $2.42 \cdot 10^{-9} \cdot x^2 + 5.95$

Figure 17: timing-sieve-of-eratosthenes



rewrite-s

rewrite-st

Figure 18: timing-rewrite-under-lets-plus-0 $\,$

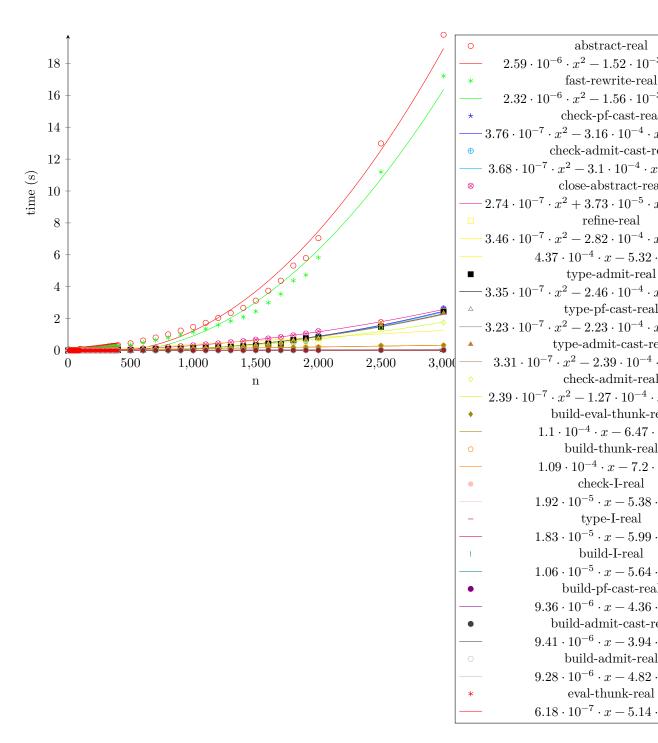


Figure 19: timing-rewrite-repeated-app-fast-rewrite-ltac2