

Figure 1: timing-pattern

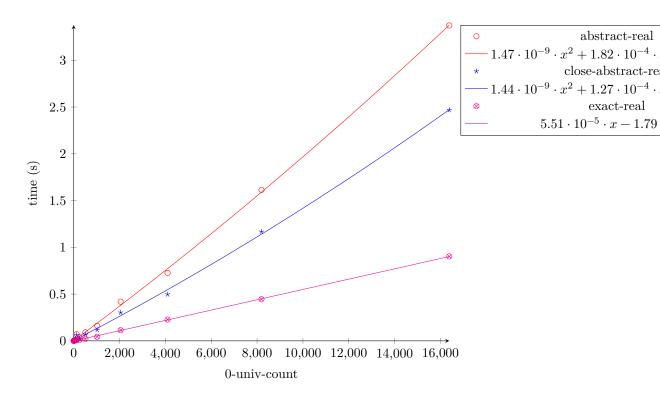
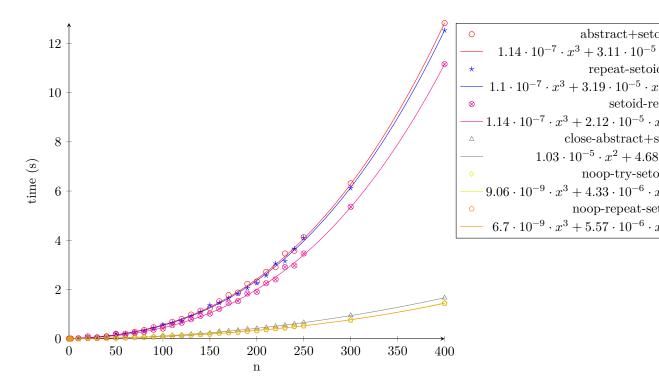
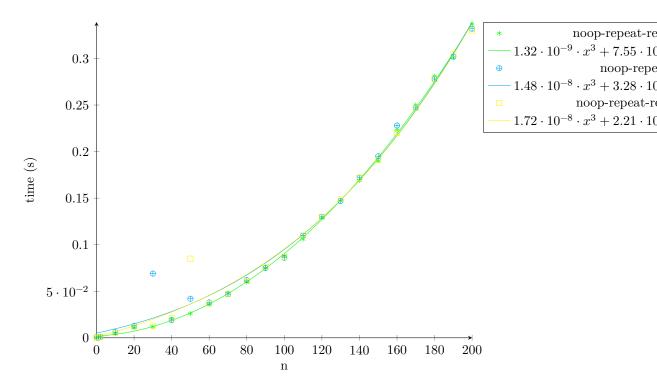


Figure 2: timing-n-polymorphic-universes param-1-n  $\,0\,$ 



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



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

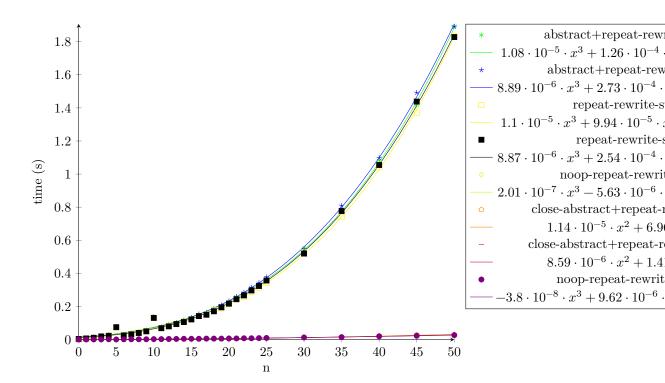


Figure 5: timing-rewrite-strat-under-binders

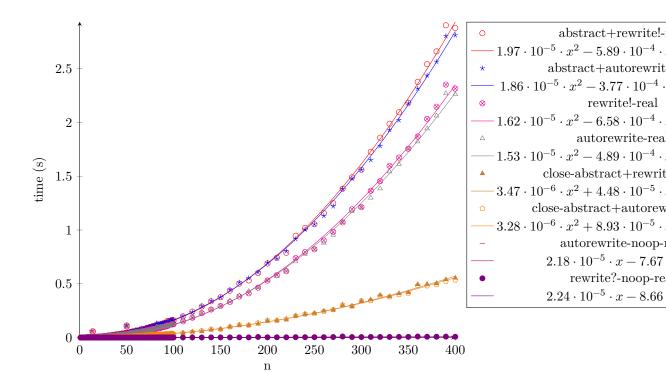
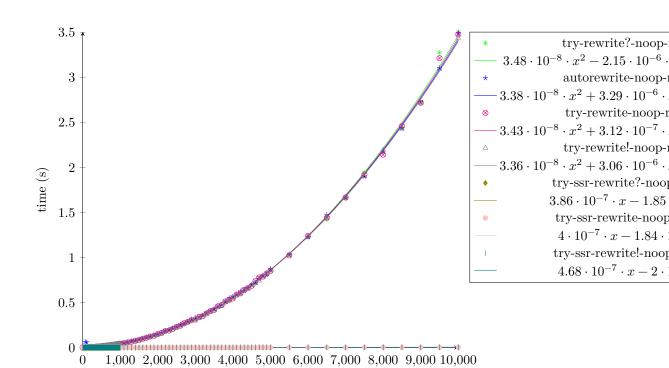


Figure 6: timing-rewrite-repeated-app-autorewrite



 $Figure \ 7: \ timing-rewrite-repeated-app-autorewrite-noop$ 

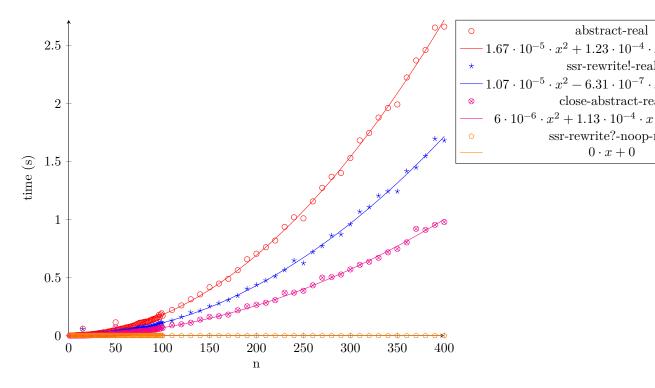
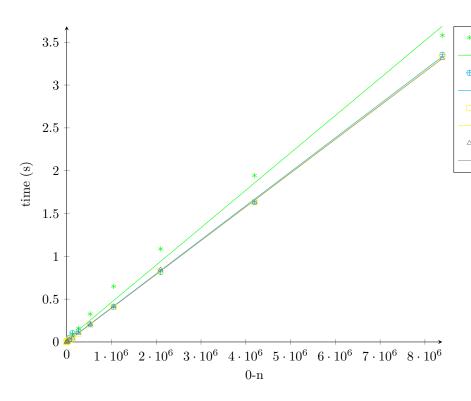


Figure 8: timing-rewrite-repeated-app-ssrrewrite



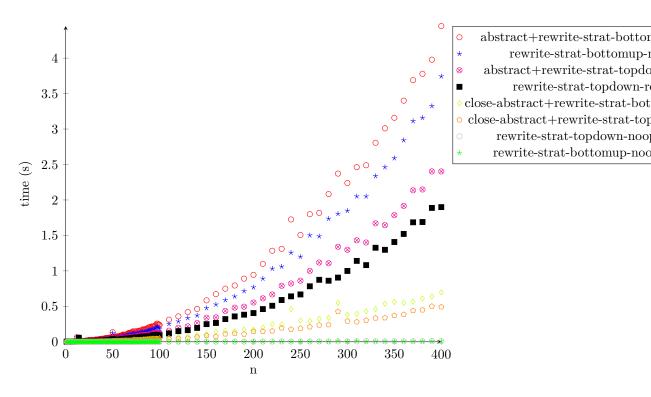
try-ssr-rewrite!-cold-noop-rea

 $4.37 \cdot 10^{-7} \cdot x + 2.53 \cdot 10^{-2}$ try-ssr-rewrite!-noop-real

 $\begin{array}{l} 3.97 \cdot 10^{-7} \cdot x + 2.49 \cdot 10^{-3} \\ \text{try-ssr-rewrite?-noop-real} \\ 3.96 \cdot 10^{-7} \cdot x - 1.69 \cdot 10^{-3} \end{array}$ 

try-ssr-rewrite-noop-real  $3.94\cdot 10^{-7}\cdot x - 3.19\cdot 10^{-4}$ 

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

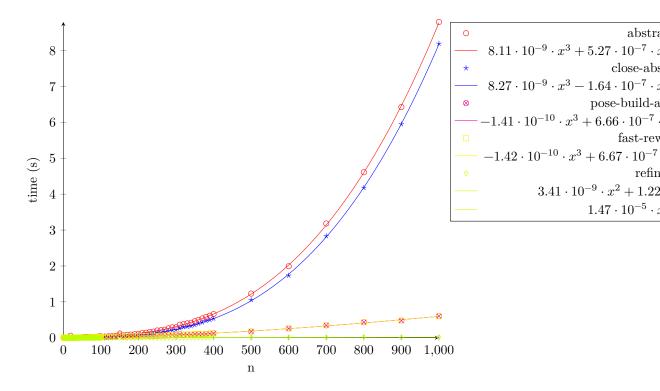


abstract + rewrite-strat-bottonrewrite-strat-bottomup-r

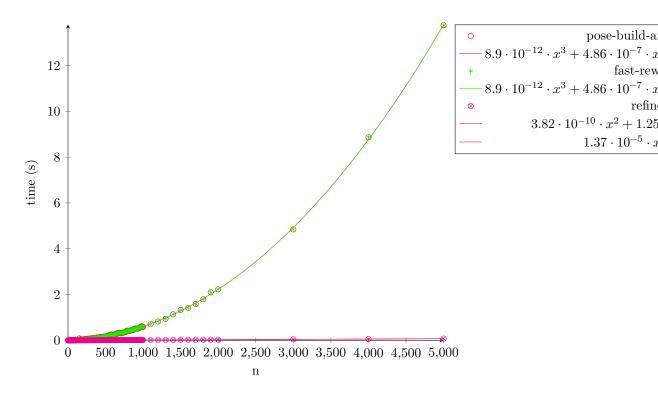
abstract+rewrite-strat-topdo rewrite-strat-topdown-re

rewrite-strat-topdown-noop rewrite-strat-bottomup-noo

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



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



Figure~12:~timing-rewrite-repeated-app-fast-rewrite-no-abstract

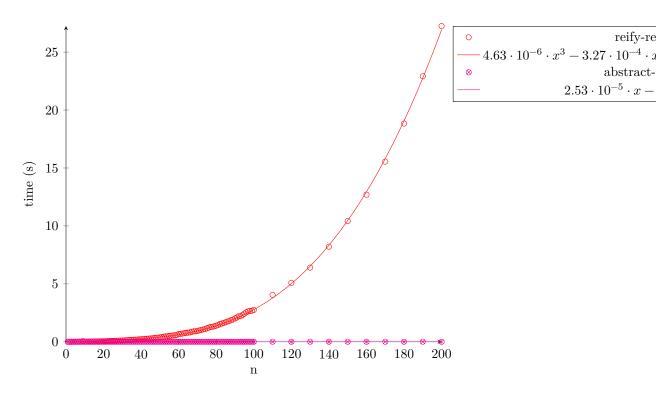


Figure 13: timing-typeclass-reification-let-in-HOAS

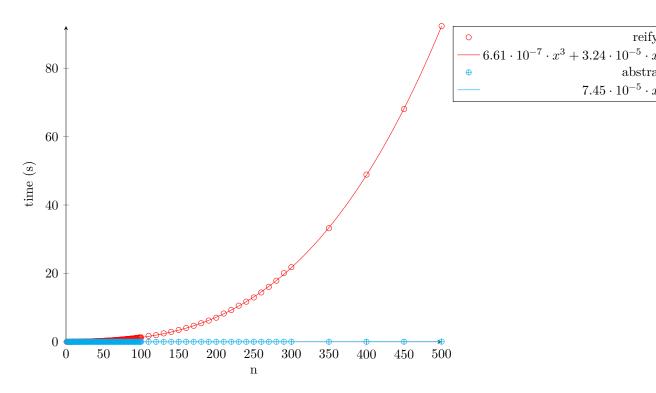


Figure 14: timing-typeclass-reification-let-in-PHOAS

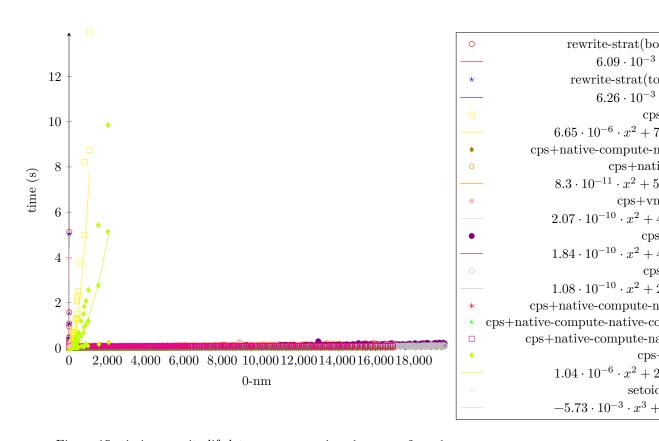


Figure 15: timing-rewrite-lift-lets-map param-1-n 1, param-2-m 1  $\,$ 

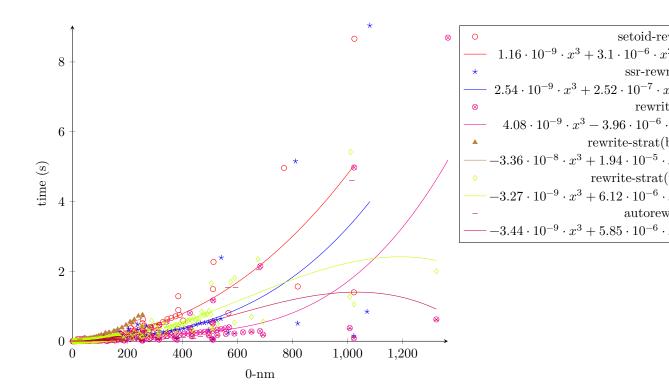


Figure 16: timing-rewrite-plus-0-tree param-1-n 0, param-2-m 1, param-3-input-size 5, param-4-output-size 3, param-5-num-rewrites 1

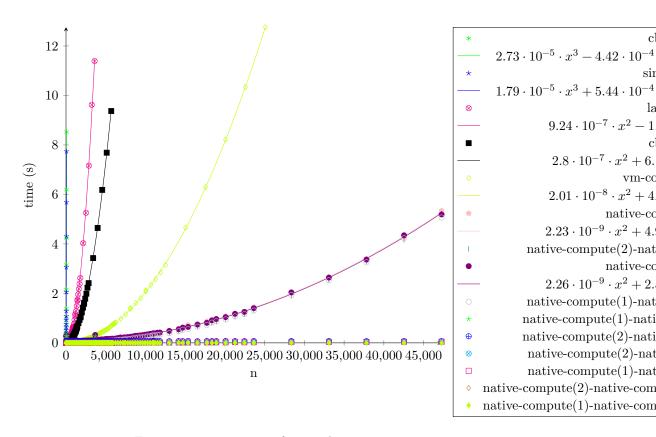
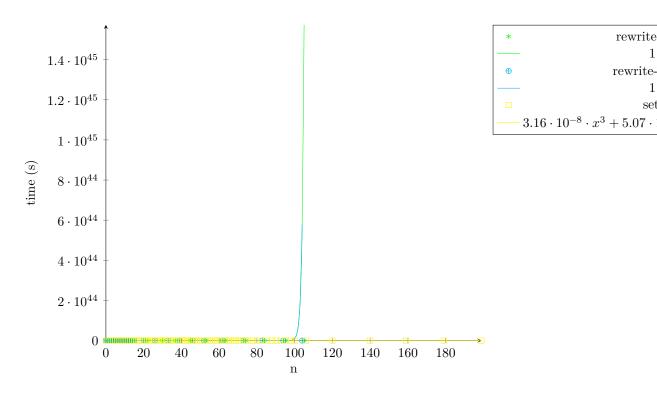


Figure 17: timing-sieve-of-eratosthenes



rewrite

rewrite-

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

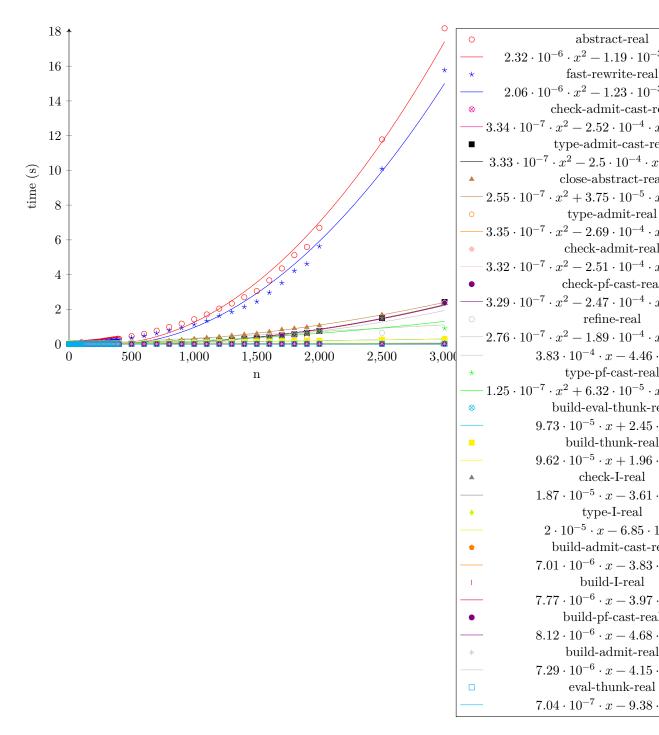


Figure 19: timing-rewrite-repeated-app-fast-rewrite-ltac2