

Figure 1: timing-pattern

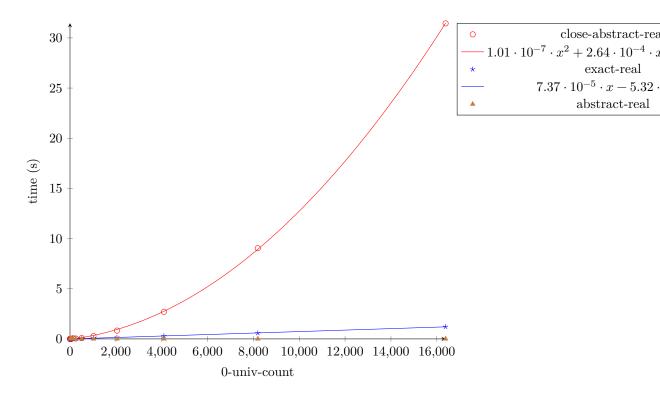
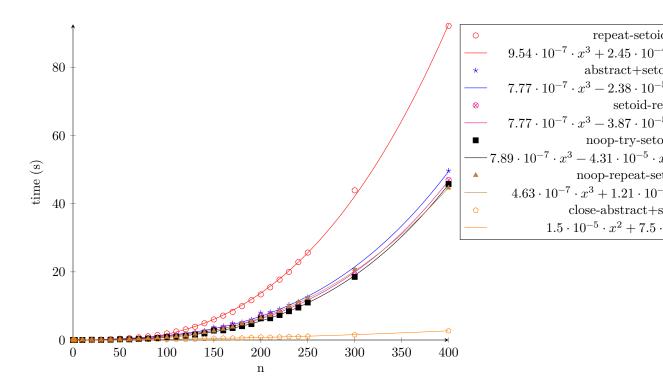


Figure 2: timing-n-polymorphic-universes param-1-n 0



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

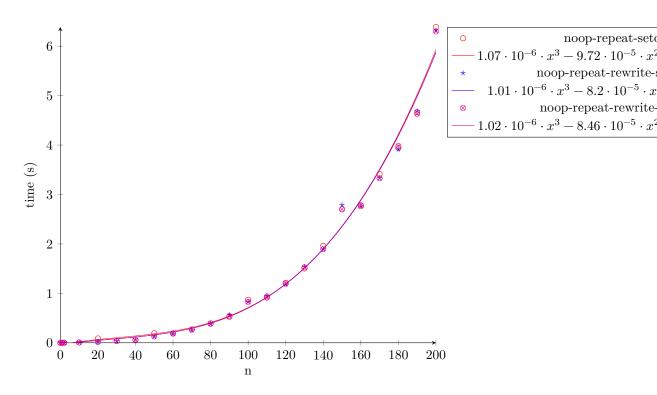
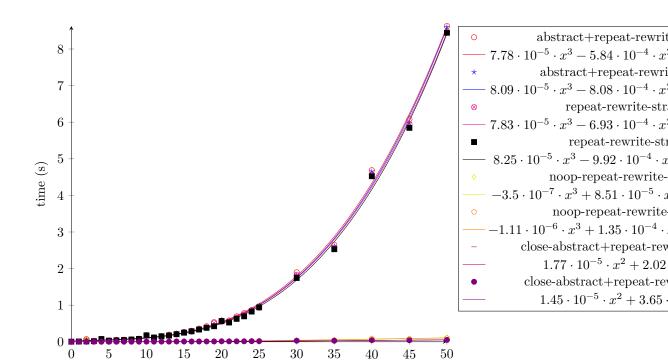
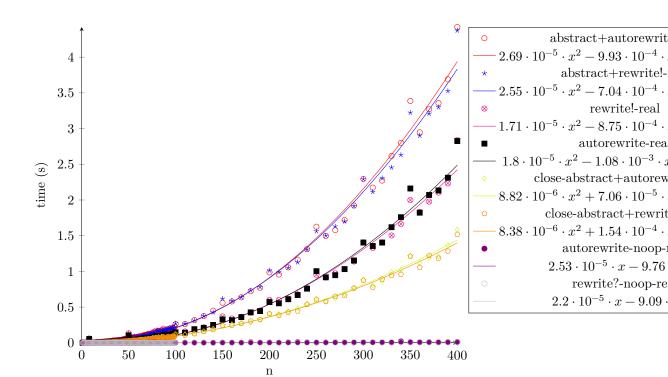


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

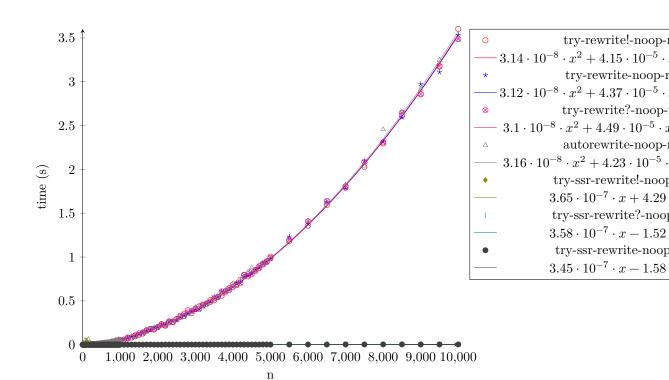


 $Figure\ 5:\ timing-rewrite-strat-under-binders$ 

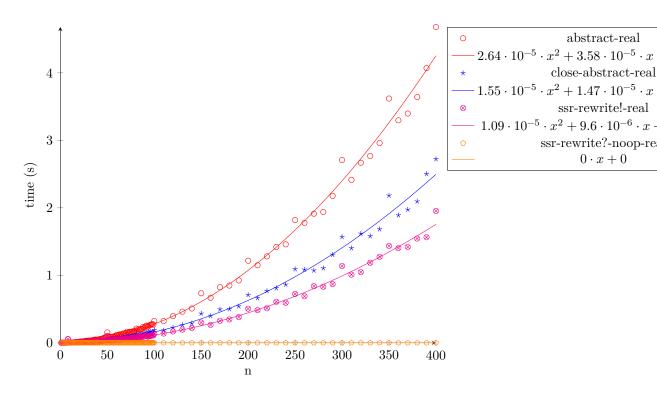
n



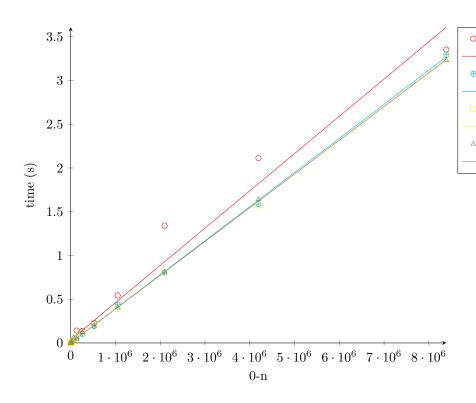
 $Figure \ 6: \ timing-rewrite-repeated-app-autorewrite \\$ 



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



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

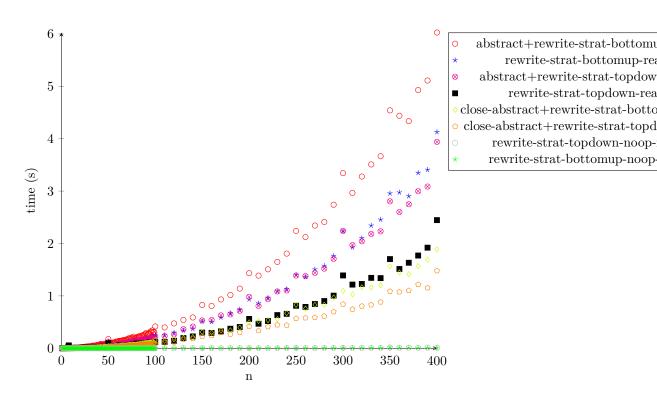


try-ssr-rewrite!-cold-noop-rea  $4.26 \cdot 10^{-7} \cdot x + 3.45 \cdot 10^{-2}$ try-ssr-rewrite?-noop-real

 $\begin{array}{l} 3.9\cdot 10^{-7}\cdot x - 5.56\cdot 10^{-4}\\ \text{try-ssr-rewrite-noop-real} \end{array}$ 

 $\begin{array}{l} 3.86\cdot 10^{-7}\cdot x - 9.77\cdot 10^{-4}\\ \text{try-ssr-rewrite!-noop-real}\\ 3.86\cdot 10^{-7}\cdot x + 2.77\cdot 10^{-3} \end{array}$ 

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

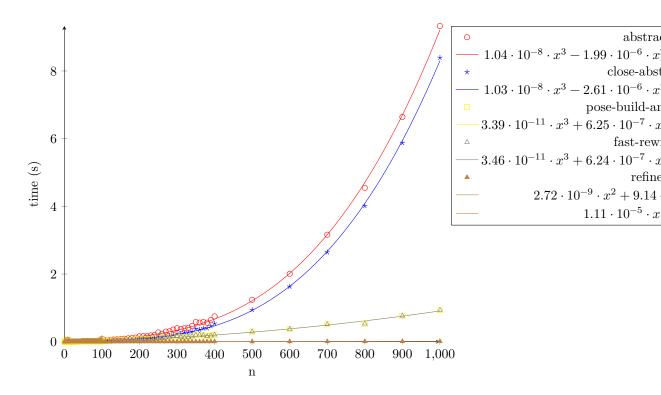


rewrite-strat-bottomup-rea

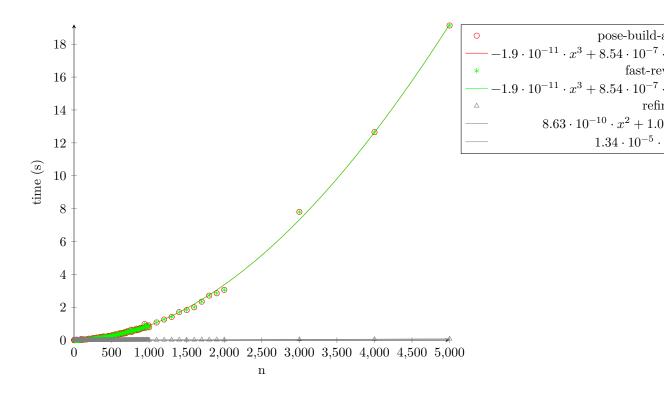
rewrite-strat-topdown-rea

rewrite-strat-topdown-nooprewrite-strat-bottomup-noop-

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



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



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

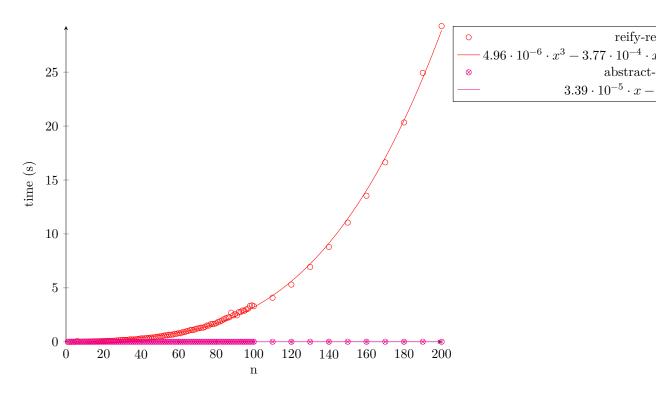


Figure 13: timing-typeclass-reification-let-in-HOAS

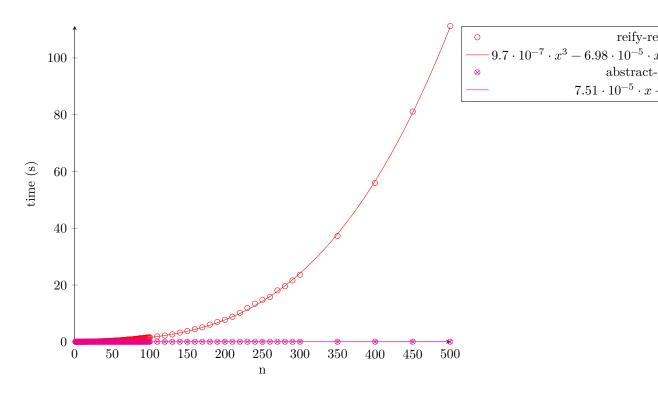


Figure 14: timing-typeclass-reification-let-in-PHOAS

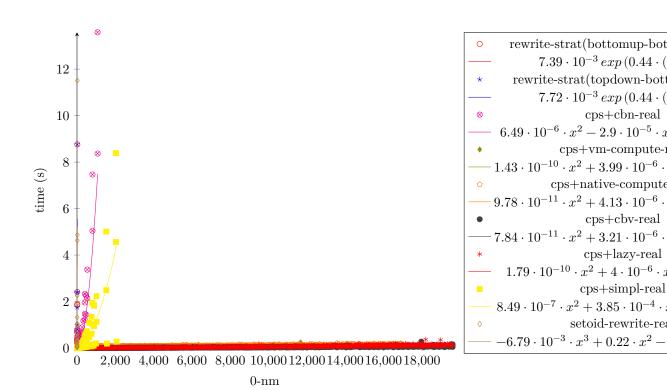


Figure 15: timing-rewrite-lift-lets-map param-1-n 1, param-2-m 1

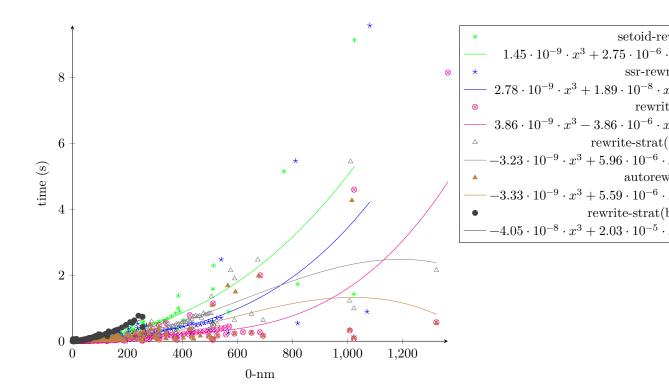
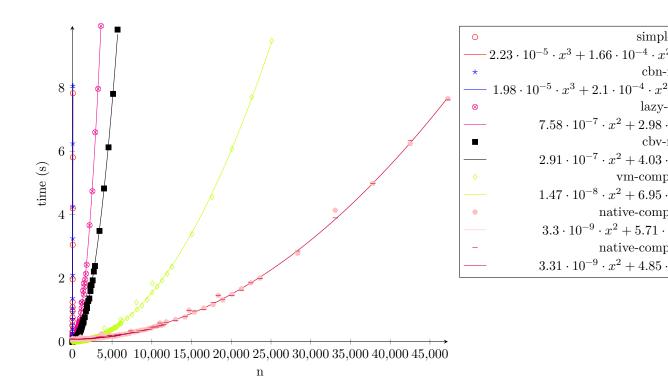


Figure 16: timing-rewrite-plus-0-tree param-1-n 0, param-2-m 1, param-3-input-size 5, param-4-output-size 3, param-5-num-rewrites 1



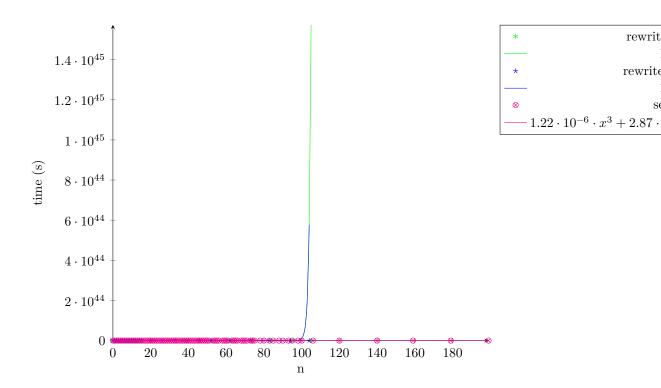
simpl

vm-comp

native-comp

native-comp

Figure 17: timing-sieve-of-eratosthenes



rewrite

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