

Figure 1: timing-pattern

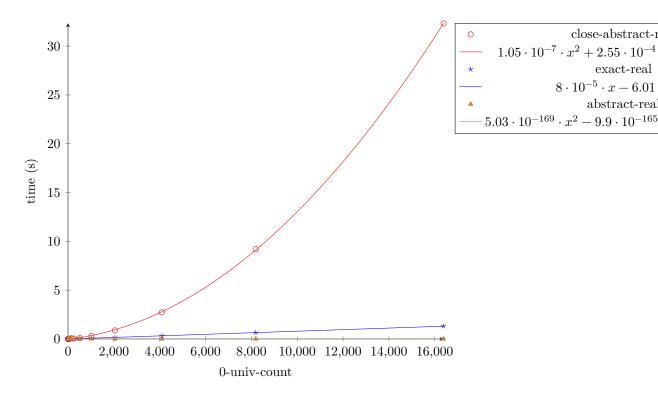
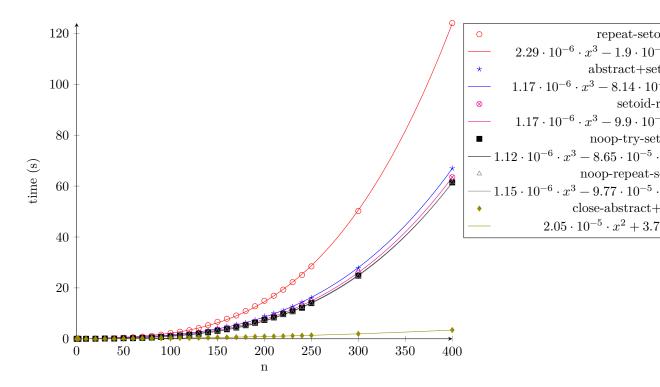


Figure 2: timing-n-polymorphic-universes param-1-n  $\,0\,$ 



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

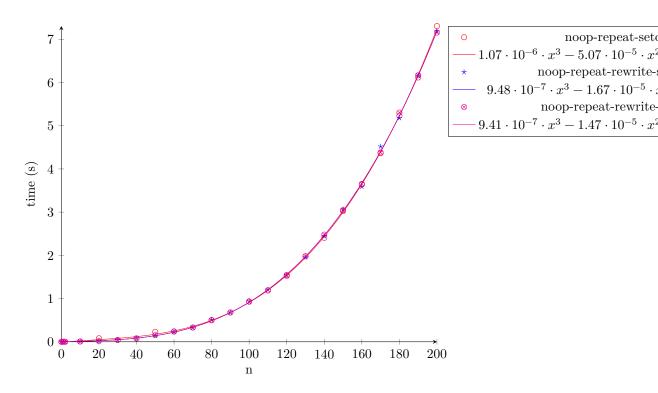
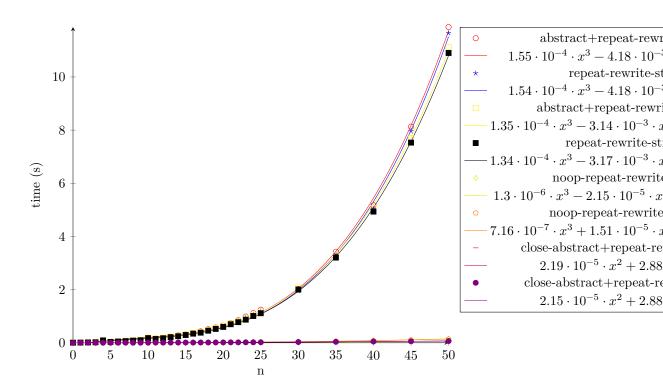


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop



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

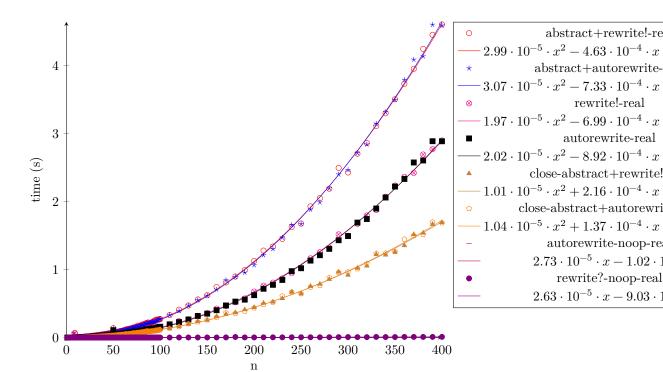
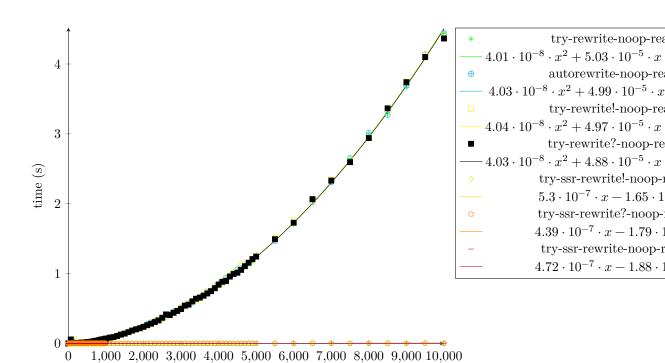
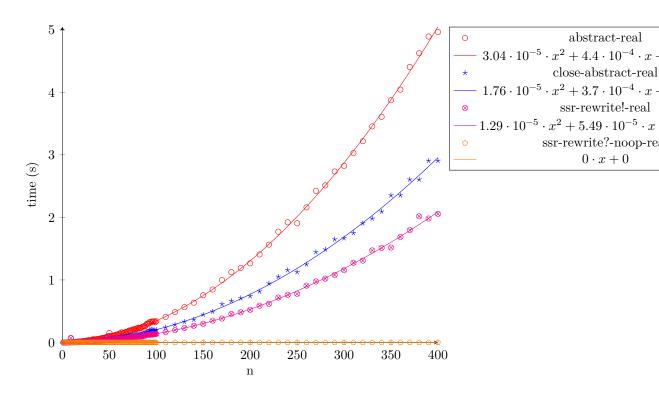


Figure 6: timing-rewrite-repeated-app-autorewrite

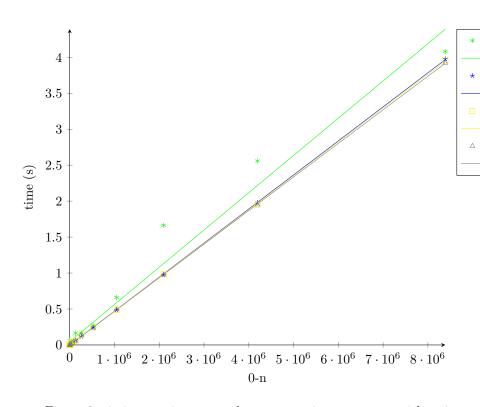


 $Figure\ 7:\ timing-rewrite-repeated-app-autorewrite-noop$ 

n



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



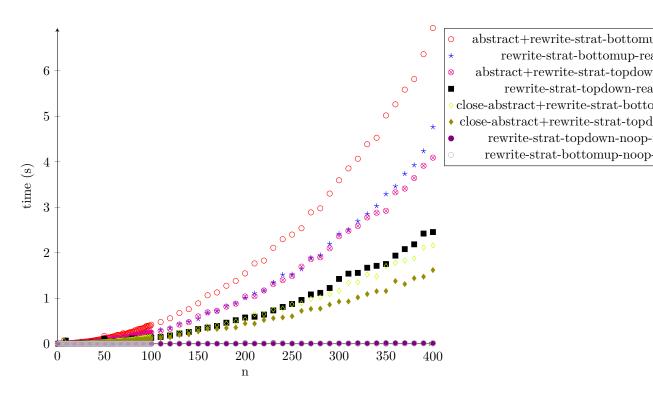
try-ssr-rewrite!-cold-noop-rea $5.18\cdot 10^{-7}\cdot x + 4.51\cdot 10^{-2}$ 

try-ssr-rewrite?-noop-real  $4.73\cdot 10^{-7}\cdot x - 2.26\cdot 10^{-3}$ 

try-ssr-rewrite!-noop-real  $4.7\cdot 10^{-7}\cdot x + 5.48\cdot 10^{-4}$ 

try-ssr-rewrite-noop-real  $4.67 \cdot 10^{-7} \cdot x - 1.01 \cdot 10^{-4}$ 

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

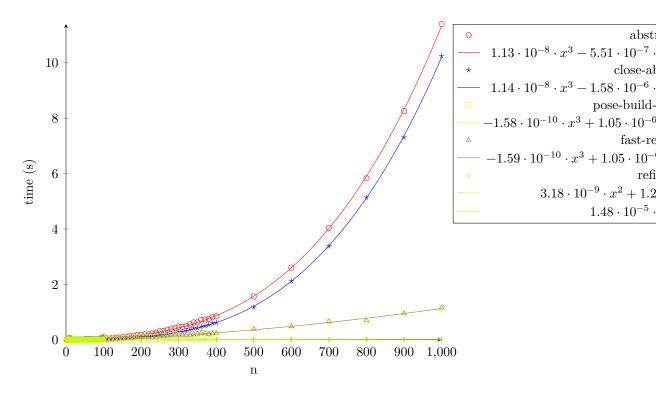


rewrite-strat-bottomup-rea

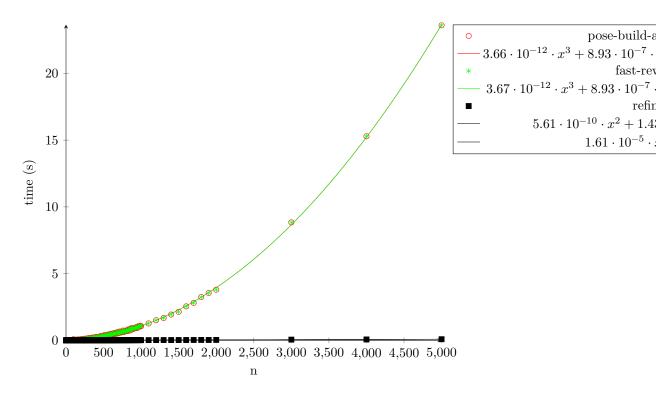
rewrite-strat-topdown-rea

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

 $Figure~10:~timing\mbox{-rewrite-repeated-app-rewrite-strat}$ 



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



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

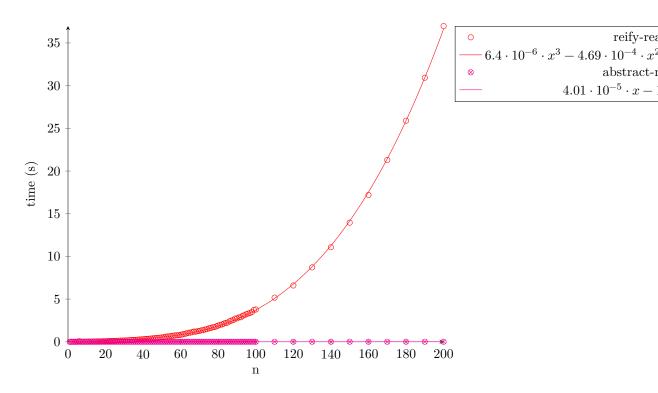


Figure 13: timing-typeclass-reification-let-in-HOAS

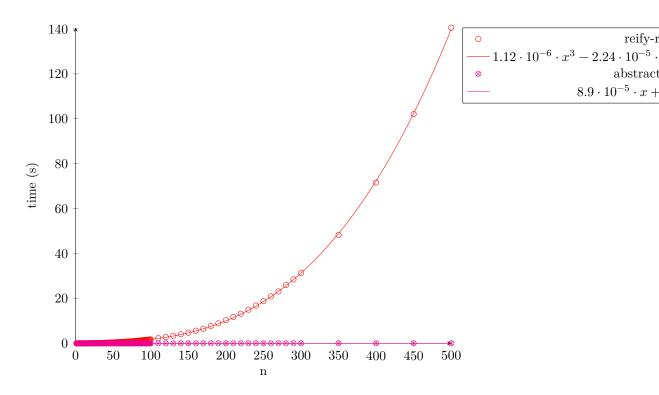


Figure 14: timing-typeclass-reification-let-in-PHOAS