

Figure 1: timing-pattern

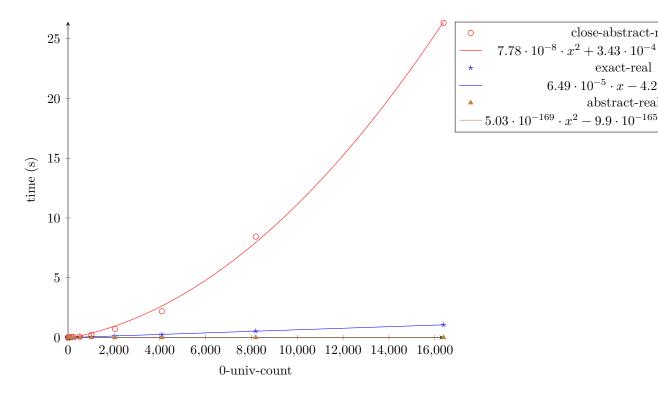
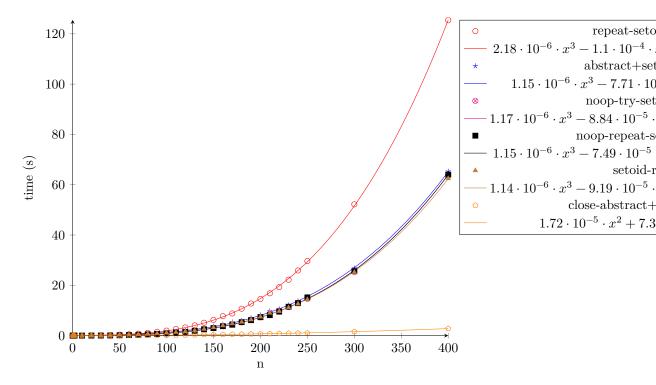
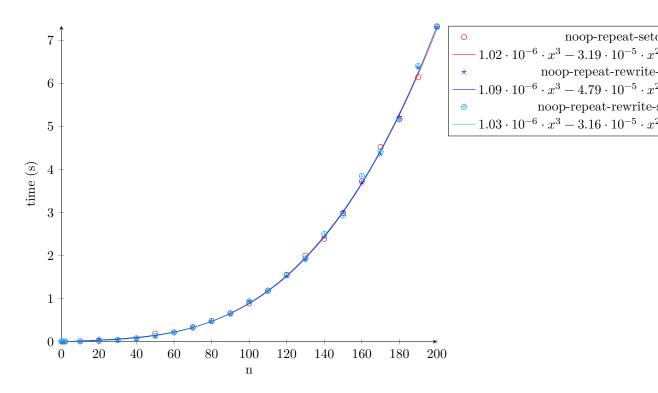


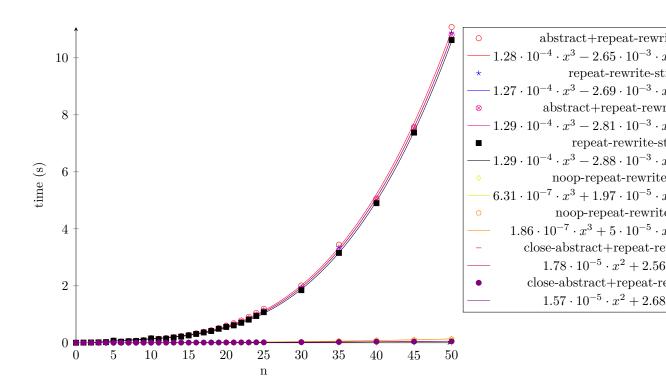
Figure 2: timing-n-polymorphic-universes param-1-n  $\,0\,$ 



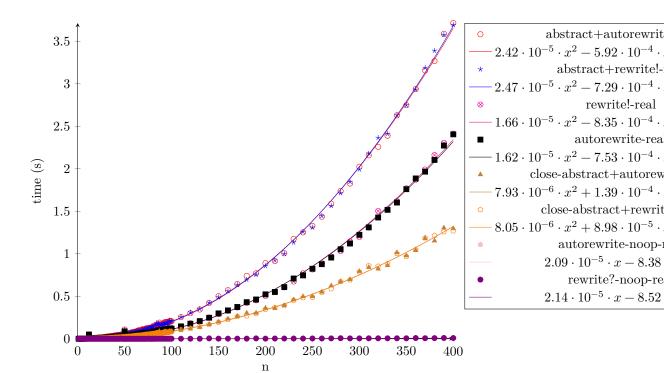
 $Figure \ 3: \ timing-repeat-setoid-rewrite-under-binders$ 



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



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



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

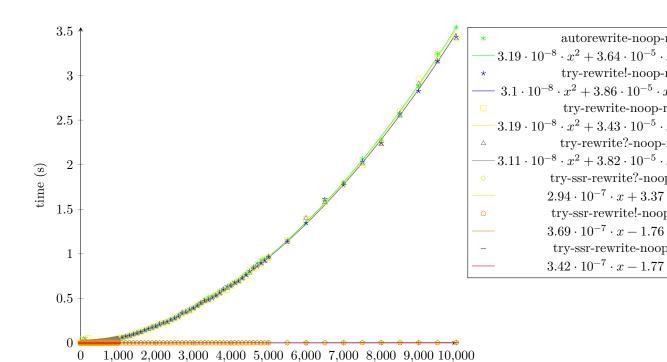


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

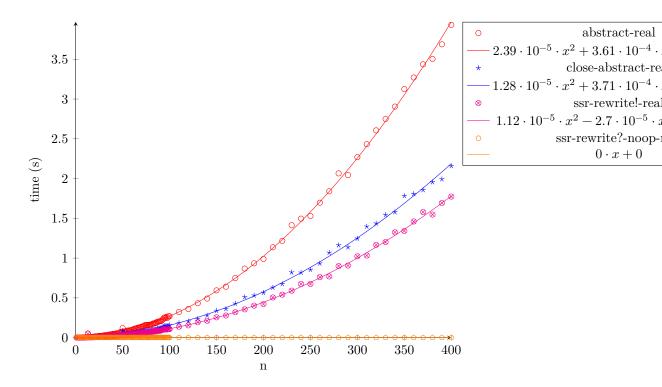
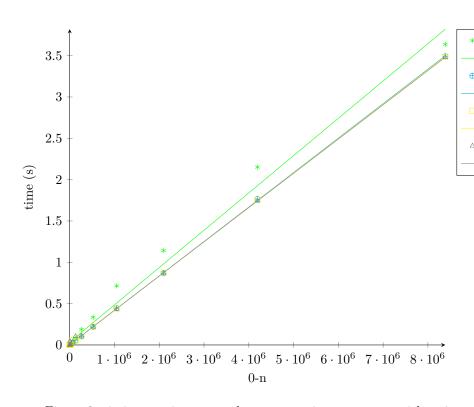


Figure 8: timing-rewrite-repeated-app-ssrrewrite



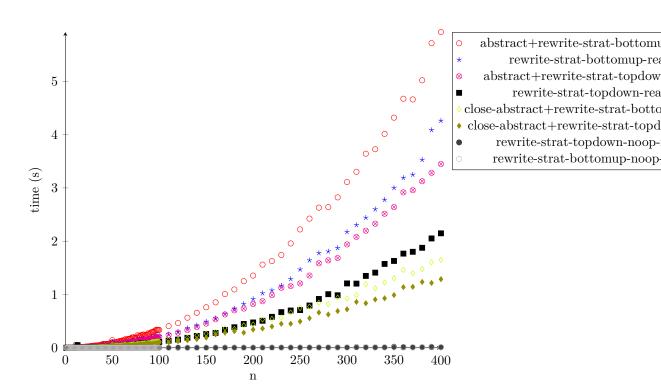
try-ssr-rewrite!-cold-noop-rea $4.51\cdot 10^{-7}\cdot x + 3.42\cdot 10^{-2}$ 

try-ssr-rewrite?-noop-real  $4.17\cdot 10^{-7}\cdot x + 6.24\cdot 10^{-4}$ 

try-ssr-rewrite-noop-real  $4.16\cdot 10^{-7}\cdot x + 1.32\cdot 10^{-3}$ 

try-ssr-rewrite!-noop-real  $4.14\cdot 10^{-7}\cdot x + 5.11\cdot 10^{-3}$ 

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



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

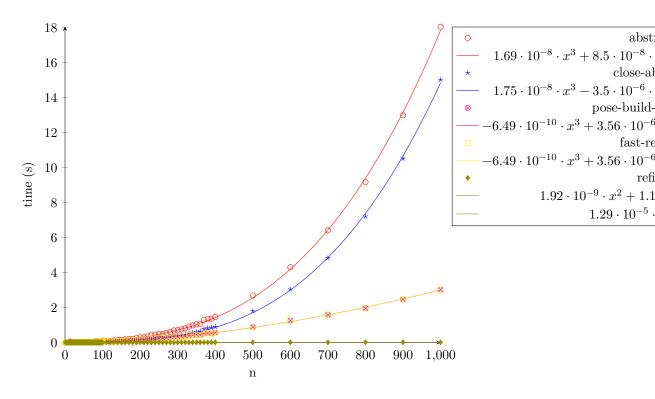
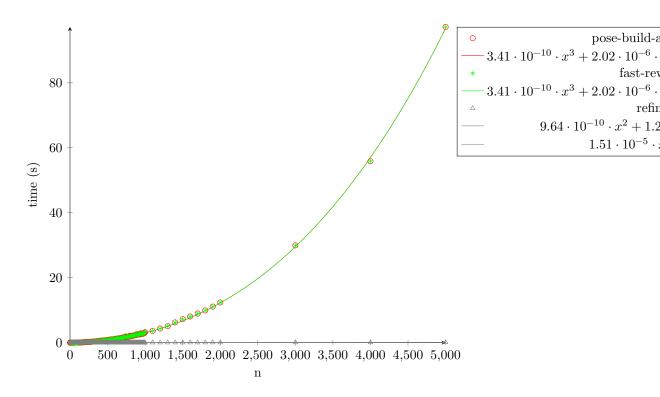
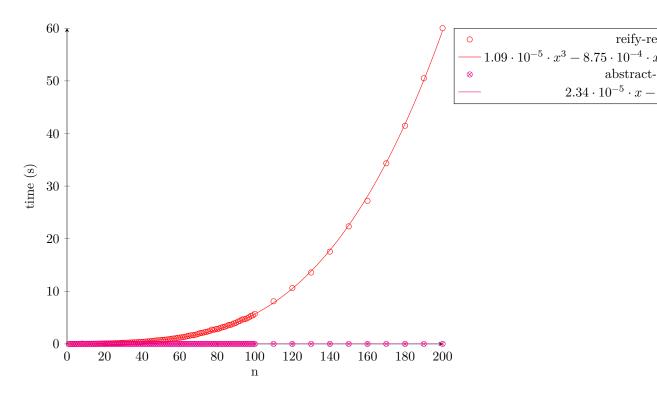


Figure 11: timing-rewrite-repeated-app-fast-rewrite



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



 ${\bf Figure~13:~timing-type class-reification-let-in-HOAS}$ 

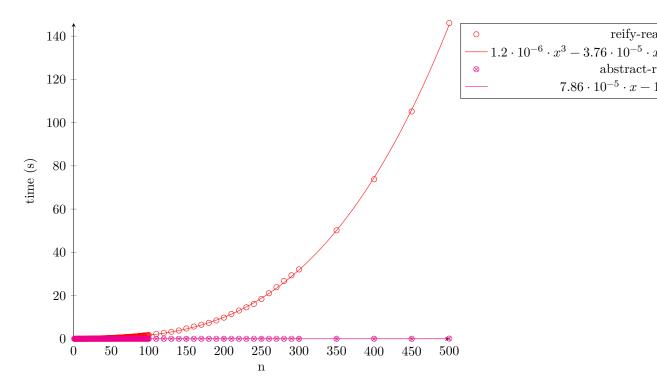


Figure 14: timing-typeclass-reification-let-in-PHOAS