

Figure 1: timing-pattern

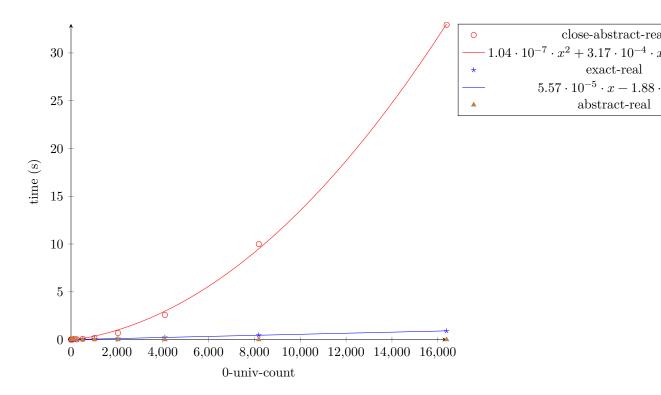


Figure 2: timing-n-polymorphic-universes param-1-n  $\,0\,$ 

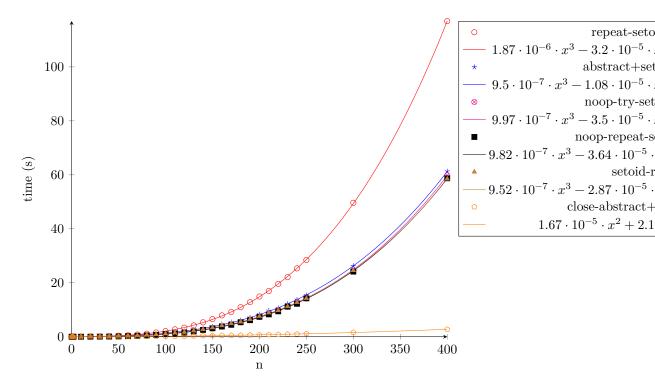


Figure 3: timing-repeat-setoid-rewrite-under-binders

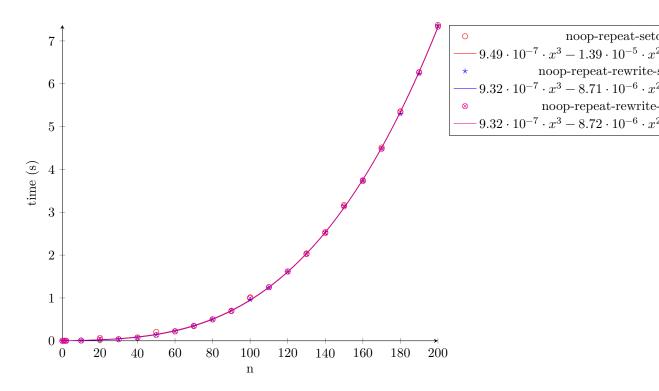
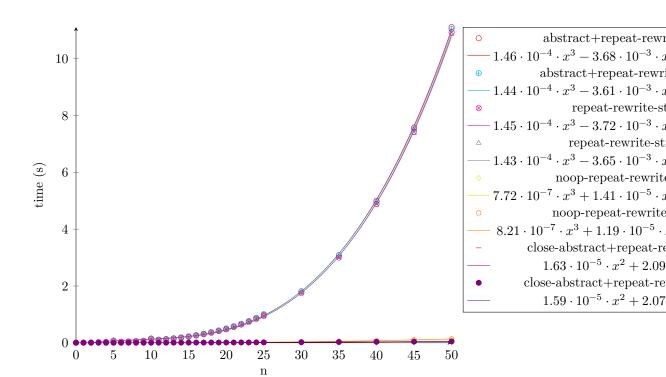


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop



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

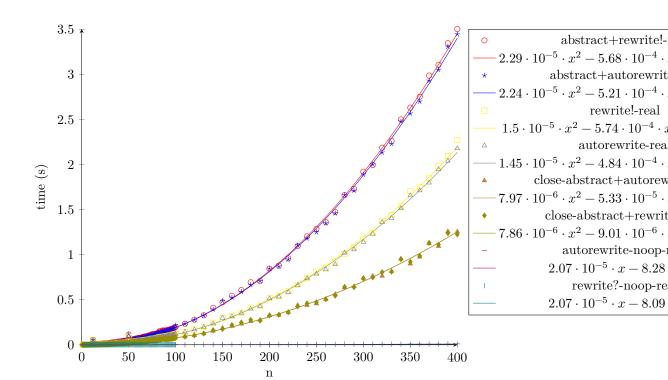
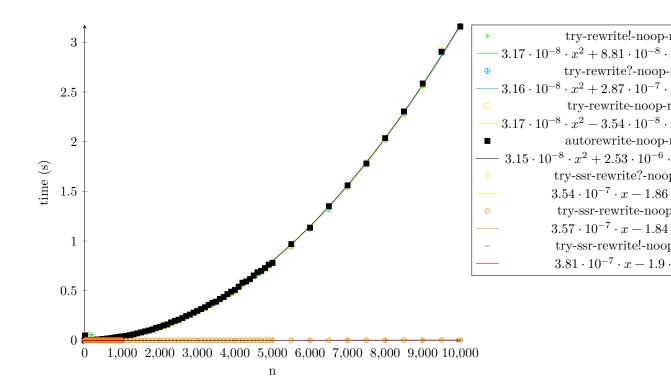
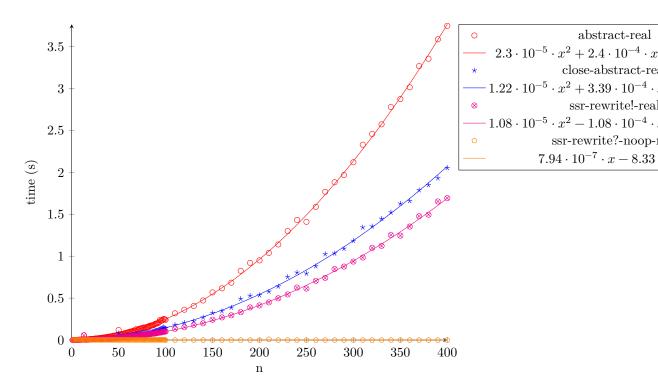


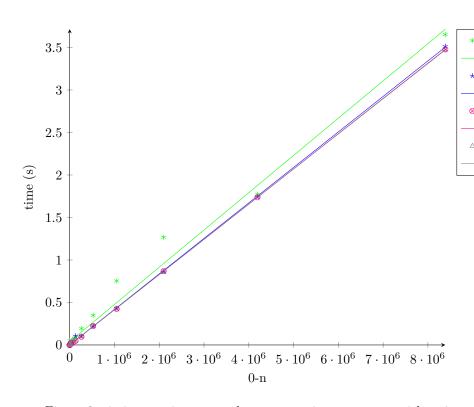
Figure 6: timing-rewrite-repeated-app-autorewrite



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



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



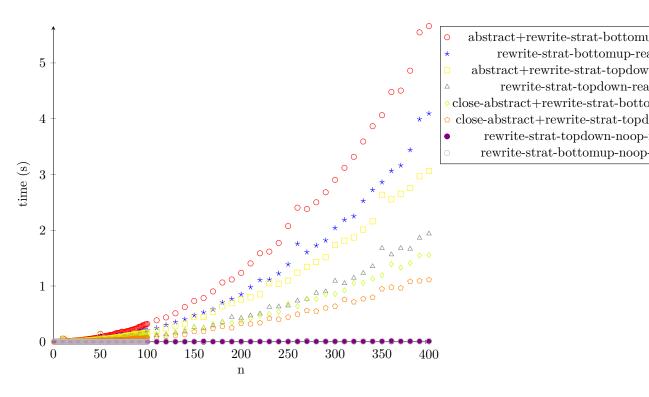
try-ssr-rewrite!-cold-noop-rea

 $4.38 \cdot 10^{-7} \cdot x + 3.85 \cdot 10^{-2}$  try-ssr-rewrite!-noop-real

 $\begin{aligned} &4.18 \cdot 10^{-7} \cdot x + 6.01 \cdot 10^{-4} \\ &\text{try-ssr-rewrite?-noop-real} \\ &4.15 \cdot 10^{-7} \cdot x - 7.75 \cdot 10^{-4} \end{aligned}$ 

try-ssr-rewrite-noop-real  $4.14\cdot 10^{-7}\cdot x + 2.49\cdot 10^{-4}$ 

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



 $abstract + rewrite - strat - bottom \\ \\$ rewrite-strat-bottomup-rea

abstract + rewrite - strat - topdowrewrite-strat-topdown-rea

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

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

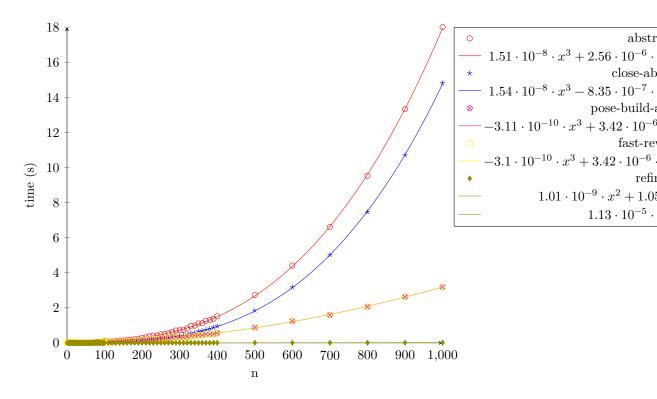


Figure 11: timing-rewrite-repeated-app-fast-rewrite

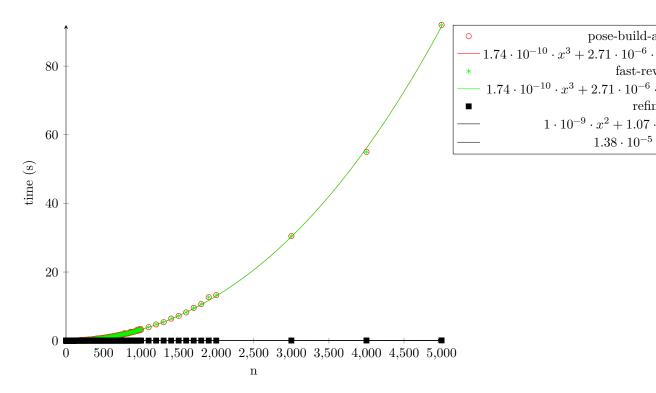
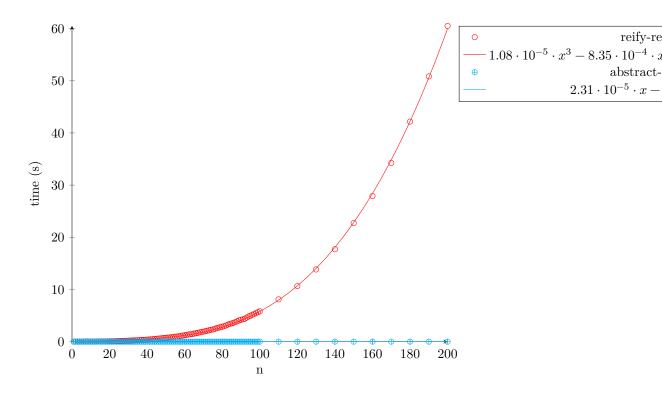
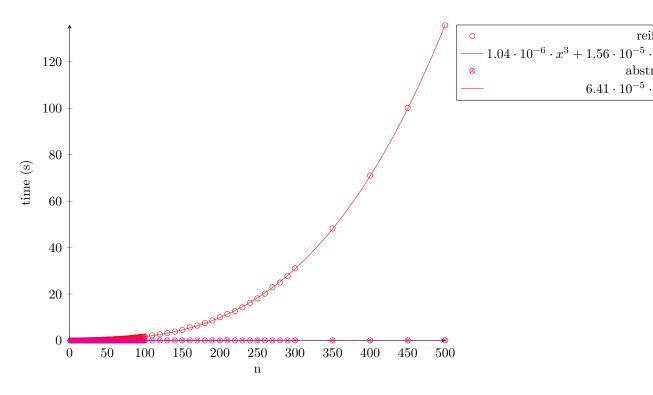


Figure 12: timing-rewrite-repeated-app-fast-rewrite-no-abstract



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



 ${\bf Figure~14:~timing-type class-reification-let-in-PHOAS}$