

Figure 1: timing-pattern

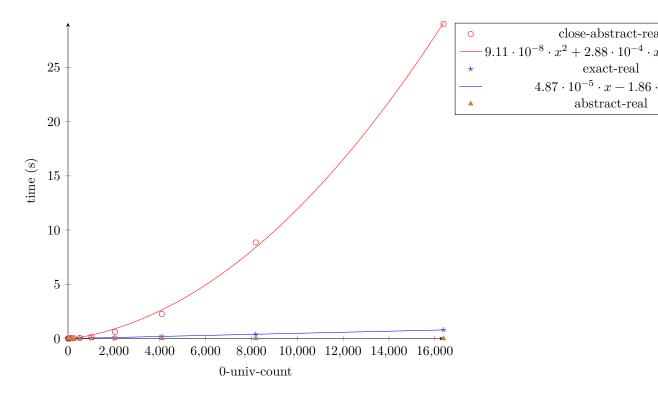
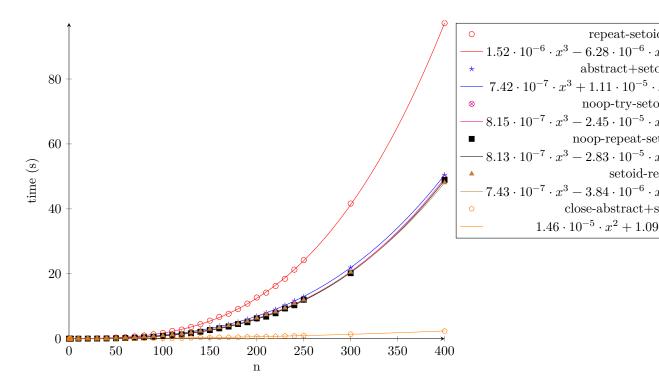
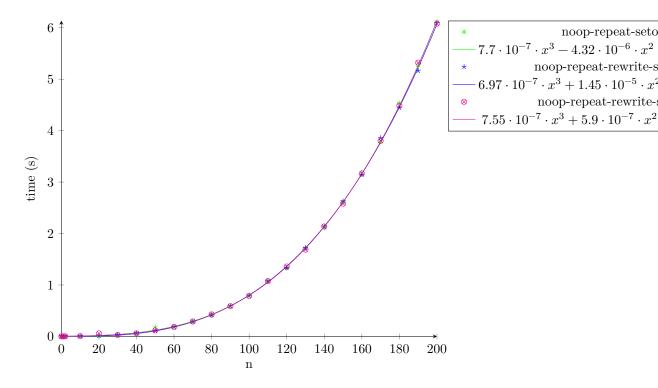


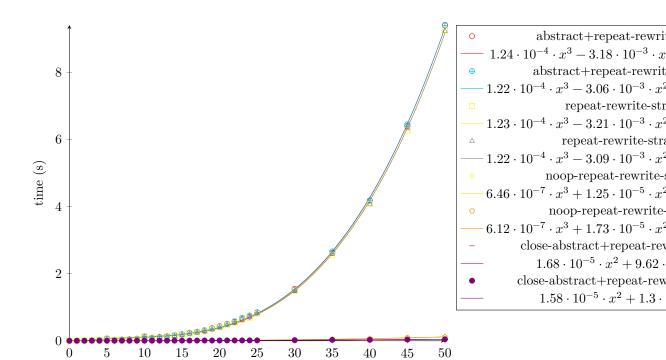
Figure 2: timing-n-polymorphic-universes param-1-n  $\,0\,$ 



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

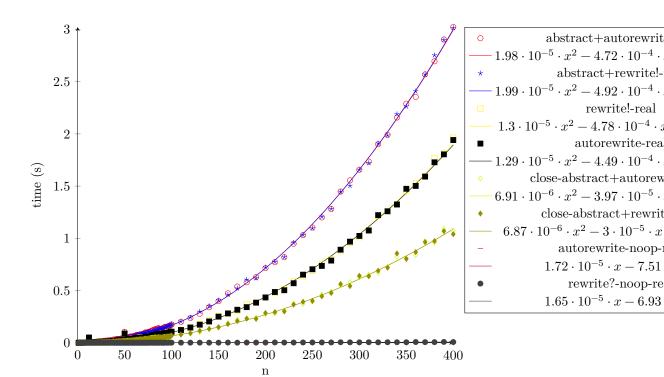


 $Figure\ 4:\ timing-repeat-setoid-rewrite-under-binders-noop$ 



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

n



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

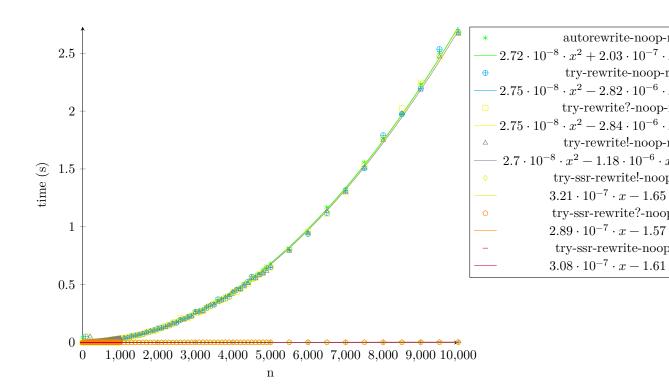


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

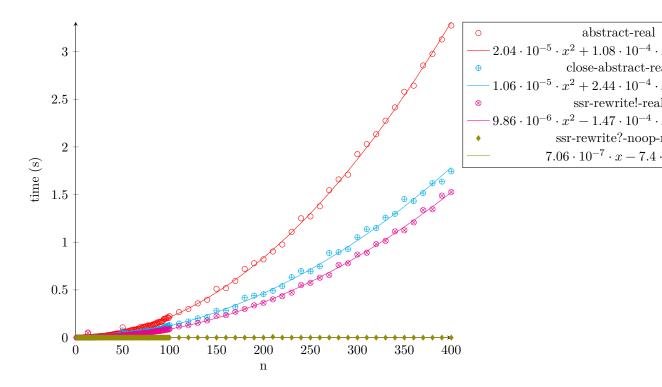
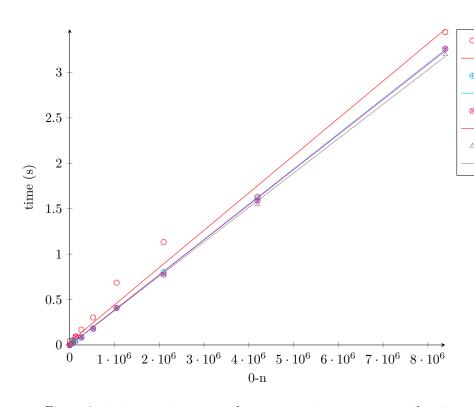


Figure 8: timing-rewrite-repeated-app-ssrrewrite

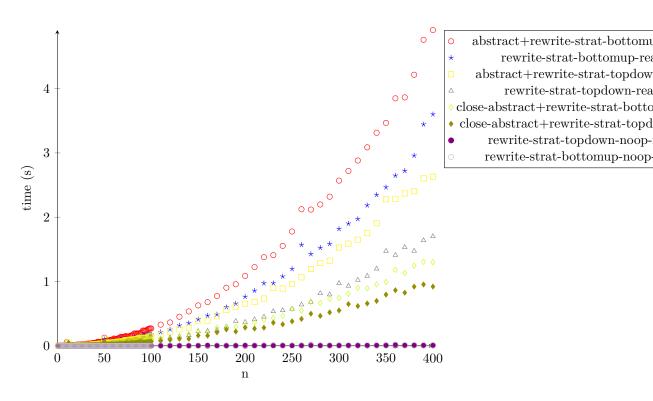


try-ssr-rewrite!-cold-noop-rea  $4.11 \cdot 10^{-7} \cdot x + 3.02 \cdot 10^{-2}$ 

 $\begin{array}{l} \text{try-ssr-rewrite-noop-real} \\ 3.88 \cdot 10^{-7} \cdot x - 2.33 \cdot 10^{-3} \\ \text{try-ssr-rewrite!-noop-real} \end{array}$ 

 $3.86 \cdot 10^{-7} \cdot x - 2.16 \cdot 10^{-3}$  try-ssr-rewrite?-noop-real  $3.79 \cdot 10^{-7} \cdot x - 3.01 \cdot 10^{-3}$ 

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



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

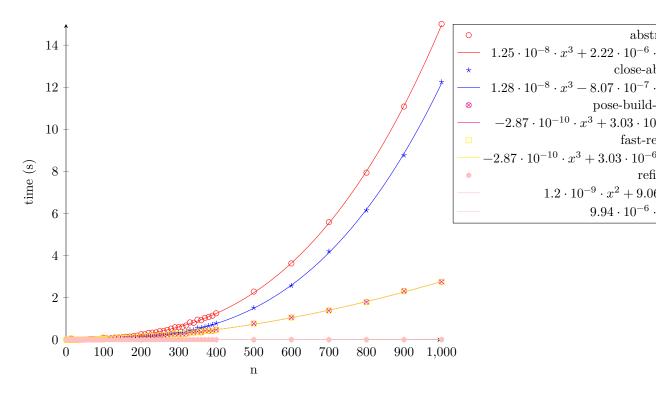
abstract + rewrite - strat - topdow

rewrite-strat-topdown-rea

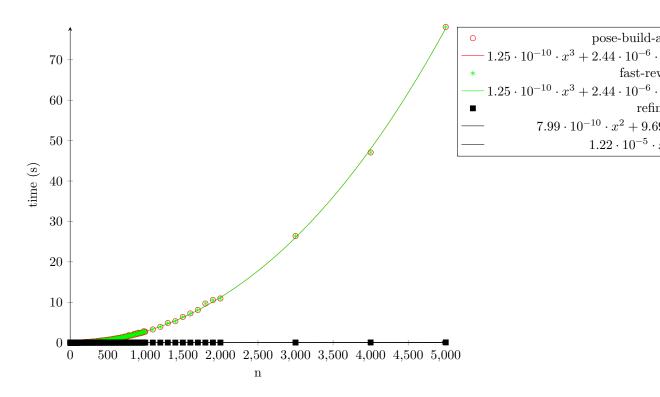
rewrite-strat-topdown-noop-

rewrite-strat-bottomup-noop-

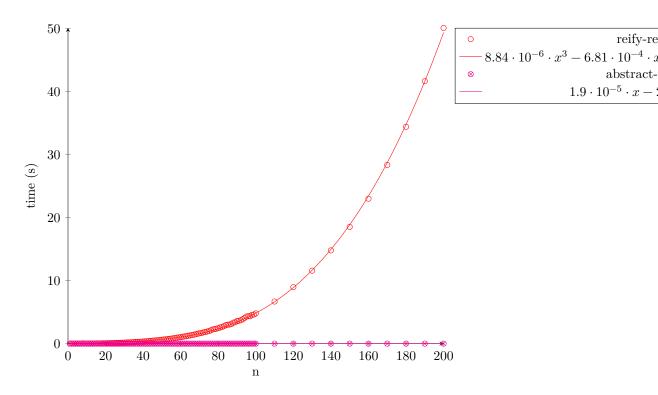
 $Figure~10:~timing\mbox{-rewrite-repeated-app-rewrite-strat}$ 



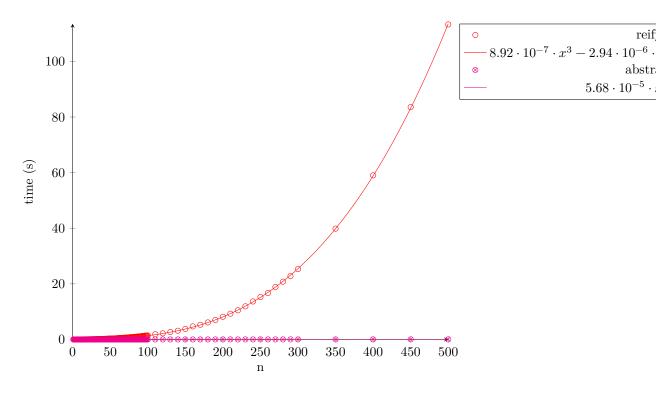
 $Figure~11:~timing\mbox{-rewrite-repeated-app-fast-rewrite}$ 



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



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



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