

Figure 1: timing-pattern

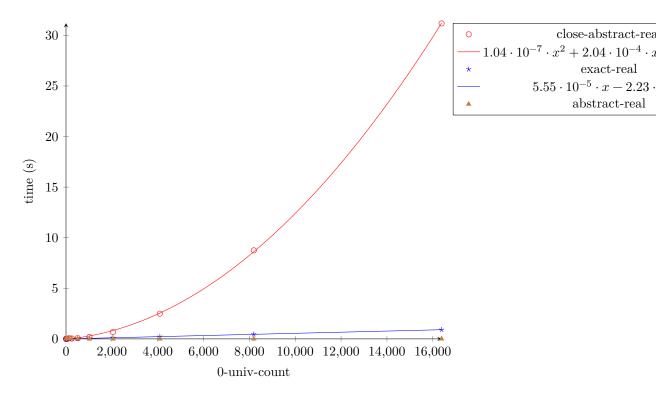


Figure 2: timing-n-polymorphic-universes param-1-n 0

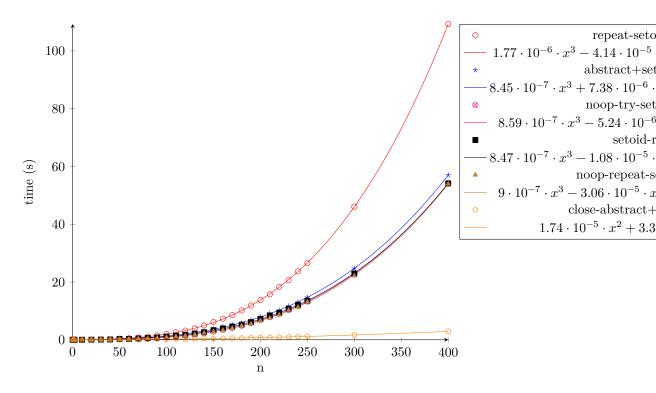


Figure 3: timing-repeat-setoid-rewrite-under-binders

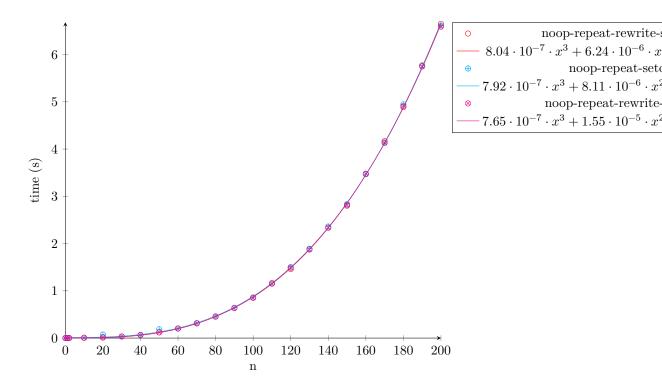


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

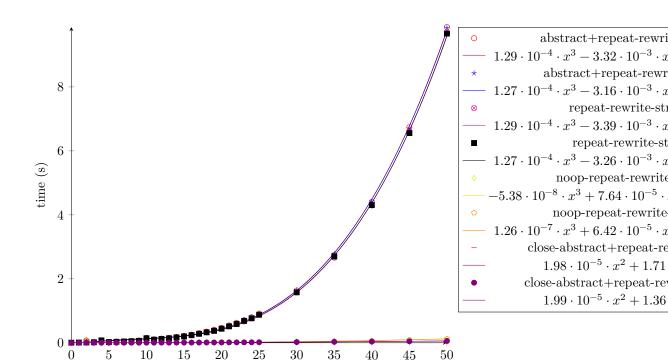
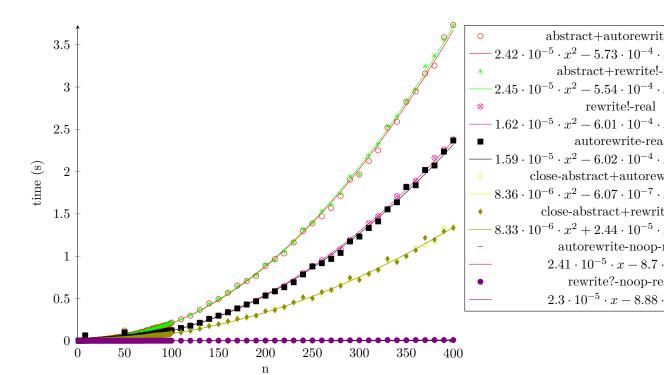
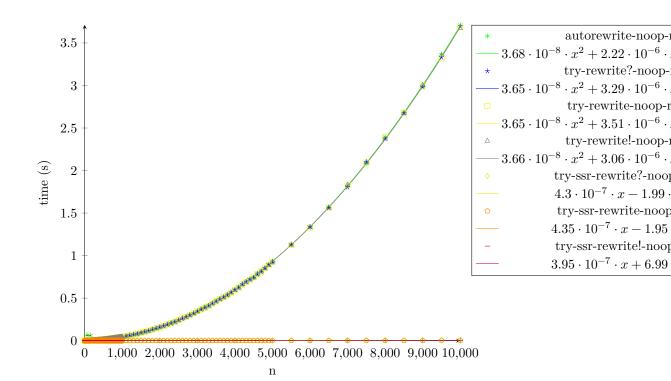


Figure 5: timing-rewrite-strat-under-binders

n



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



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

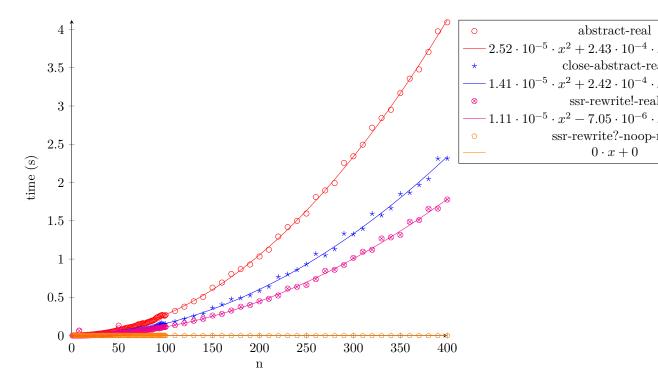
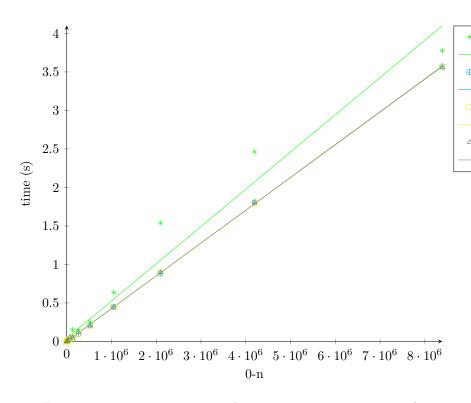


Figure 8: timing-rewrite-repeated-app-ssrrewrite



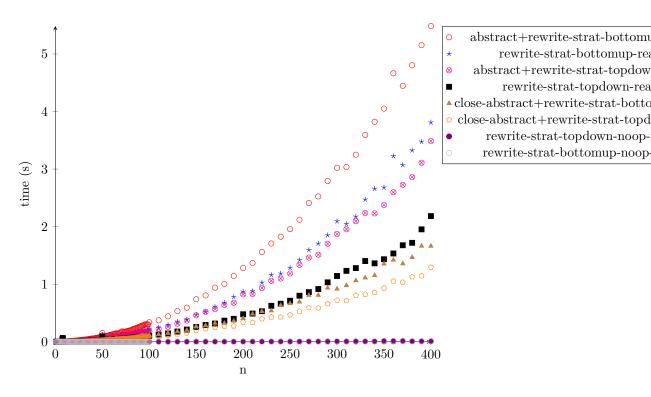
try-ssr-rewrite!-cold-noop-rea  $4.84 \cdot 10^{-7} \cdot x + 4.06 \cdot 10^{-2}$ try-ssr-rewrite-noop-real

 $\begin{array}{l} 4.27\cdot 10^{-7}\cdot x - 2.01\cdot 10^{-3}\\ \text{try-ssr-rewrite?-noop-real} \end{array}$ 

 $\begin{array}{l} 4.25\cdot 10^{-7}\cdot x - 1.58\cdot 10^{-3} \\ \text{try-ssr-rewrite!-noop-real} \end{array}$ 

 $4.26\cdot 10^{-7}\cdot x + 1.22\cdot 10^{-3}$ 

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



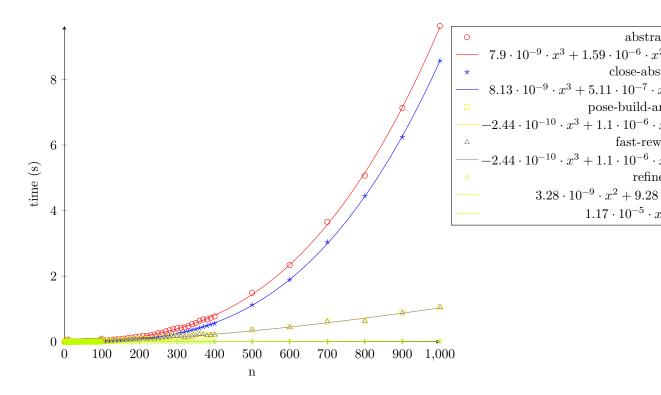
rewrite-strat-bottomup-rea

rewrite-strat-topdown-rea

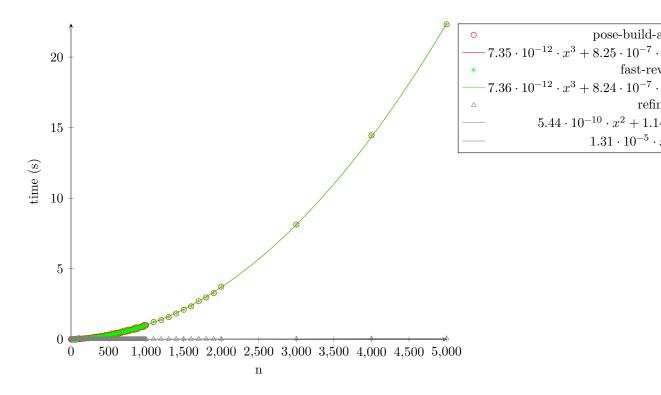
rewrite-strat-topdown-nooprewrite-strat-bottomup-noop-

abstract + rewrite - strat - topdow

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



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



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

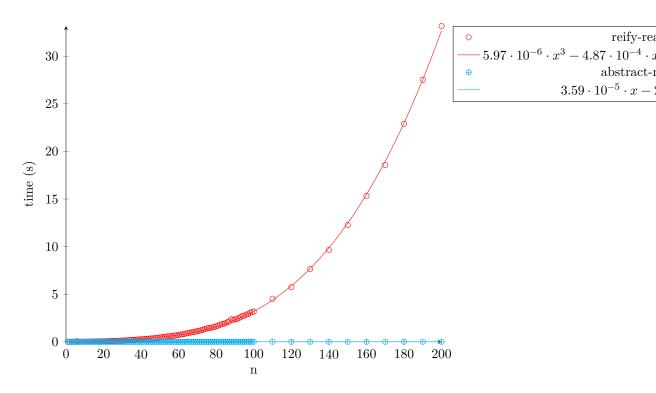


Figure 13: timing-typeclass-reification-let-in-HOAS

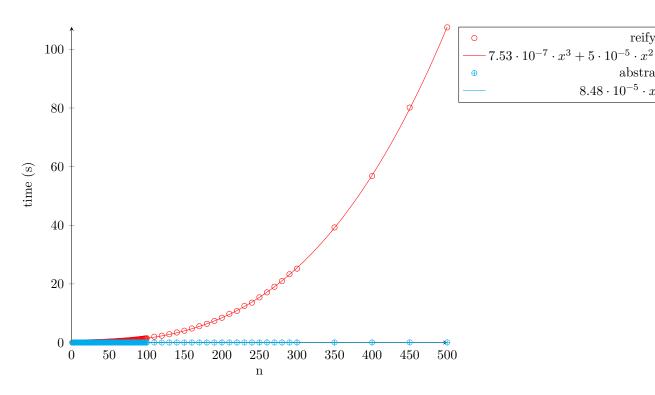


Figure 14: timing-typeclass-reification-let-in-PHOAS

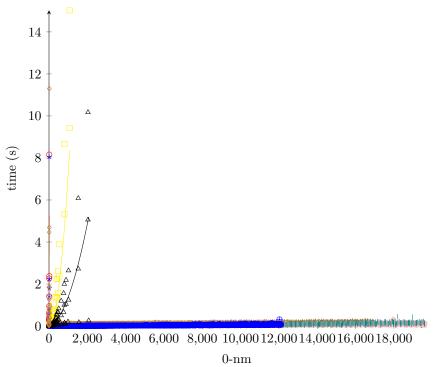


Figure 15: timing-rewrite-lift-lets-map param-1-n 1, param-2-m 1

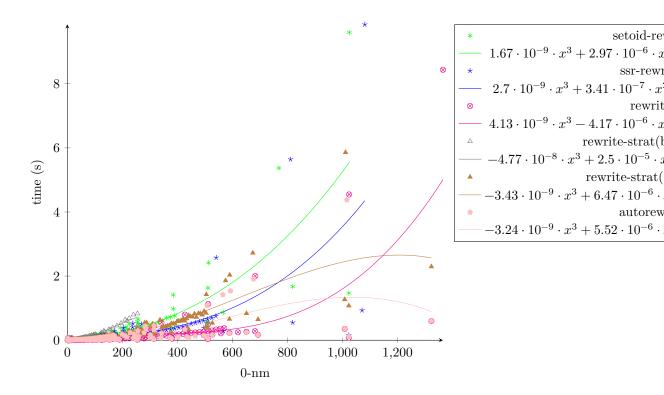
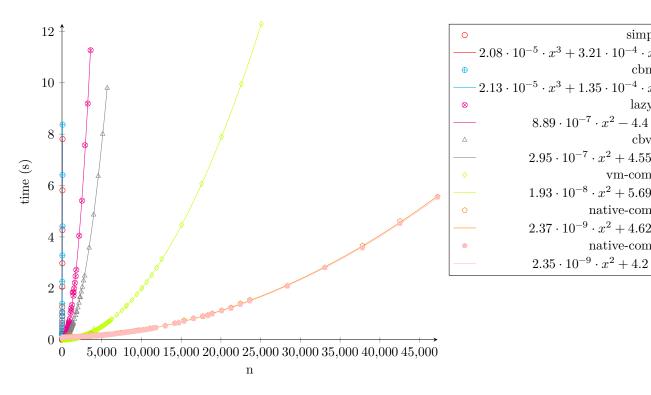


Figure 16: timing-rewrite-plus-0-tree param-1-n 0, param-2-m 1, param-3-input-size 5, param-4-output-size 3, param-5-num-rewrites 1



simp

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 $8.89 \cdot 10^{-7} \cdot x^2 - 4.4$ 

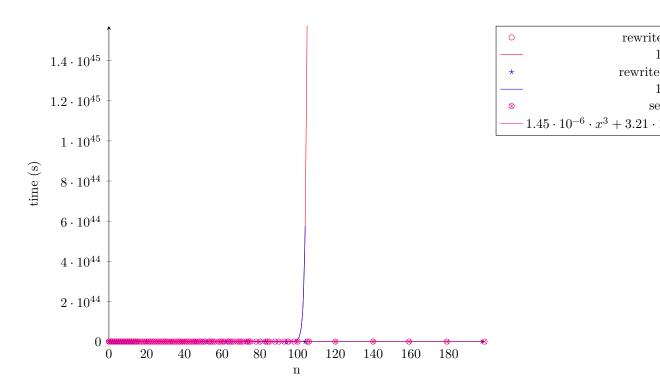
 $2.95 \cdot 10^{-7} \cdot x^2 + 4.55$ 

 $1.93 \cdot 10^{-8} \cdot x^2 + 5.69$ 

 $2.37 \cdot 10^{-9} \cdot x^2 + 4.62$ 

 $2.35 \cdot 10^{-9} \cdot x^2 + 4.2$ 

Figure 17: timing-sieve-of-eratosthenes



rewrite

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