

Figure 1: timing-pattern

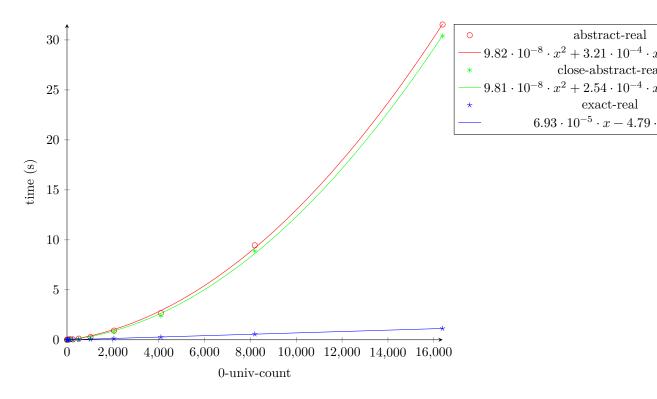
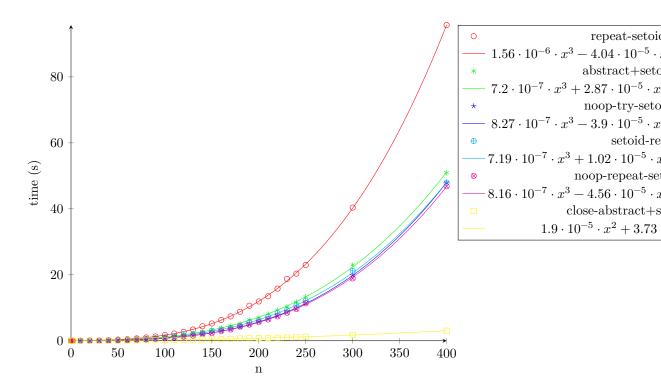


Figure 2: timing-n-polymorphic-universes param-1-n $\,0\,$



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

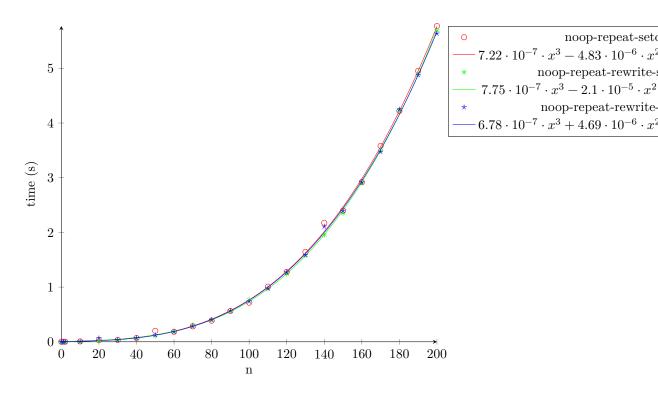
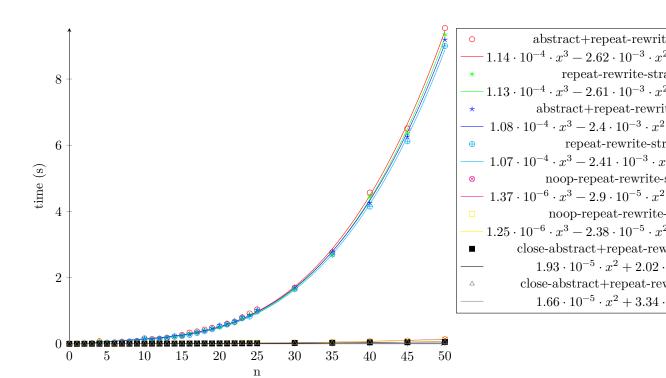
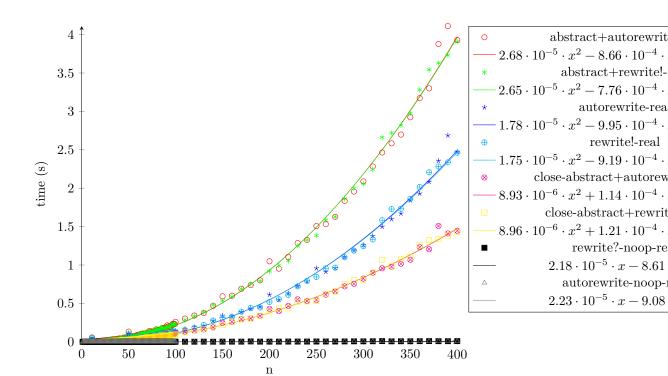


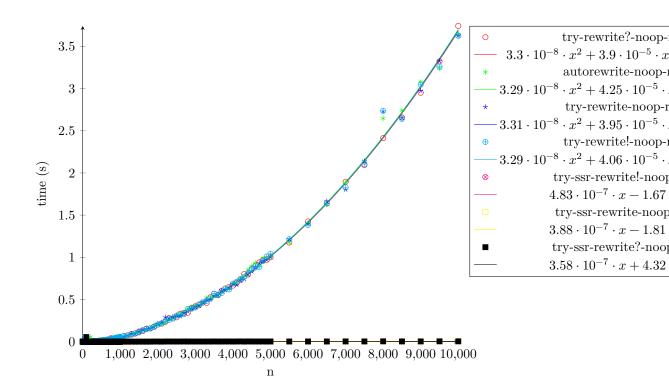
Figure 4: timing-repeat-setoid-rewrite-under-binders-noop



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



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



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

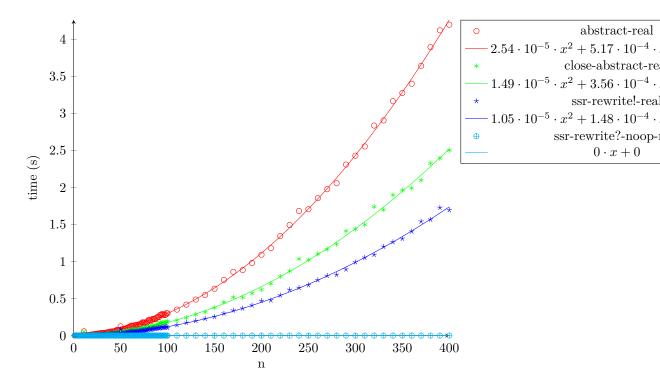
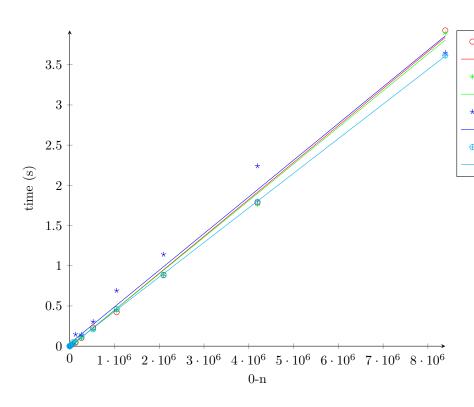


Figure 8: timing-rewrite-repeated-app-ssrrewrite



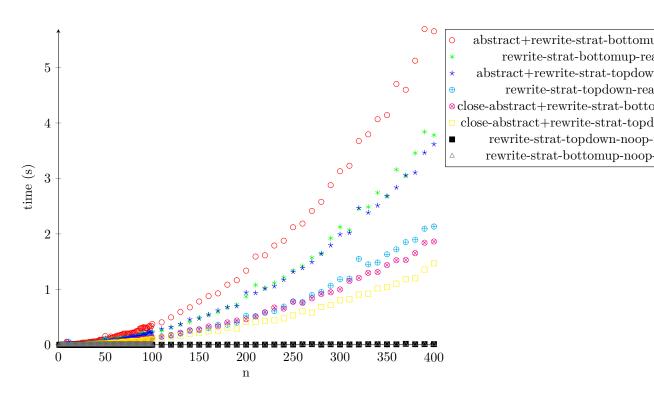
 $\begin{array}{l} \text{try-ssr-rewrite-noop-real} \\ 4.59 \cdot 10^{-7} \cdot x - 1.18 \cdot 10^{-2} \end{array}$

try-ssr-rewrite?-noop-real $4.55\cdot 10^{-7}\cdot x - 1.08\cdot 10^{-2}$

try-ssr-rewrite!-cold-noop-rea $4.56\cdot 10^{-7}\cdot x + 3.21\cdot 10^{-2}$ try-ssr-rewrite!-noop-real

 $4.3\cdot 10^{-7}\cdot x - 3.93\cdot 10^{-4}$

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



rewrite-strat-bottomup-rea

rewrite-strat-topdown-rea

 $Figure\ 10:\ timing-rewrite-repeated-app-rewrite-strat$

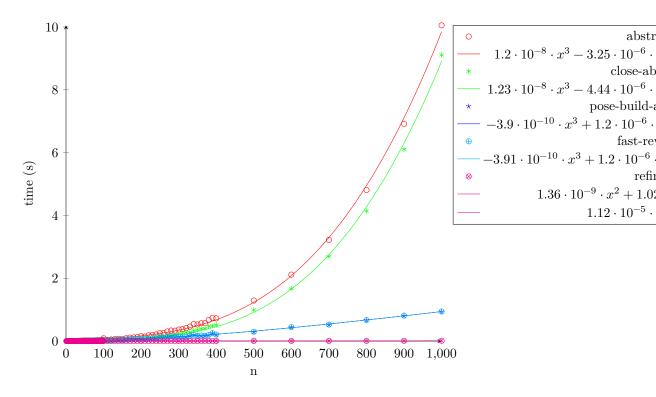
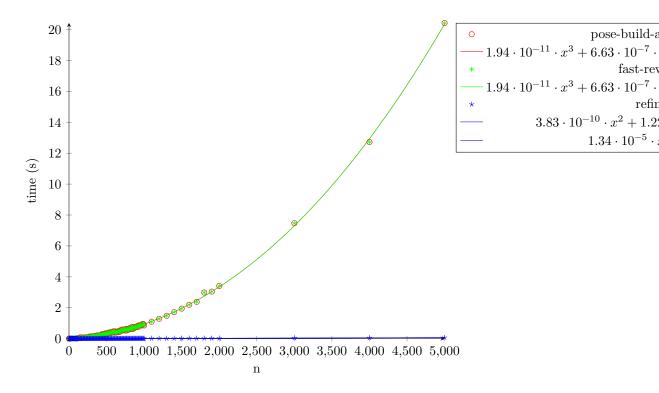
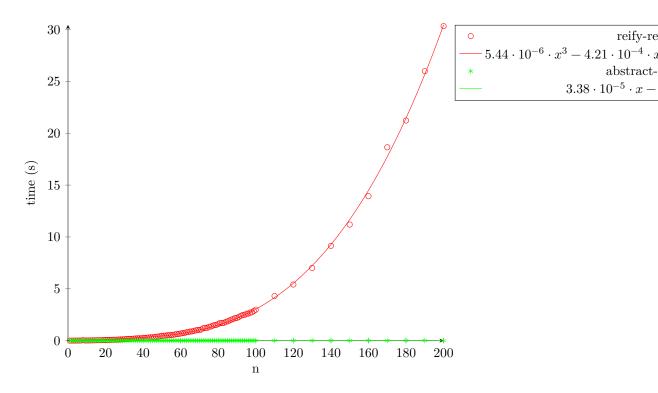


Figure 11: timing-rewrite-repeated-app-fast-rewrite



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



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

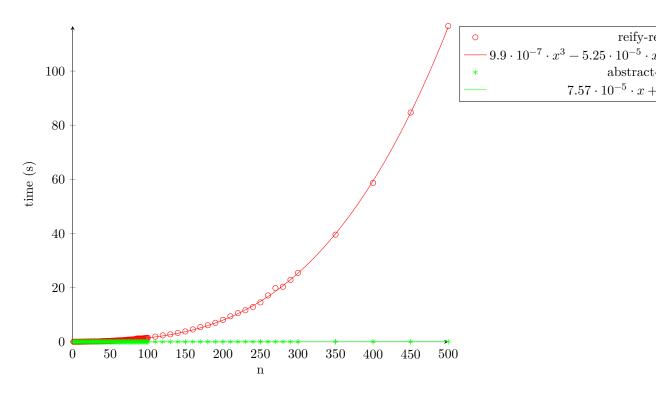


Figure 14: timing-typeclass-reification-let-in-PHOAS

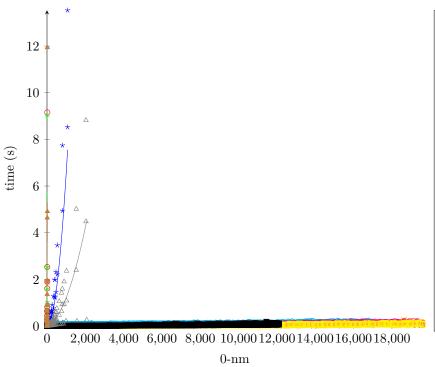


Figure 15: timing-rewrite-lift-lets-map param-1-n 1, param-2-m 1

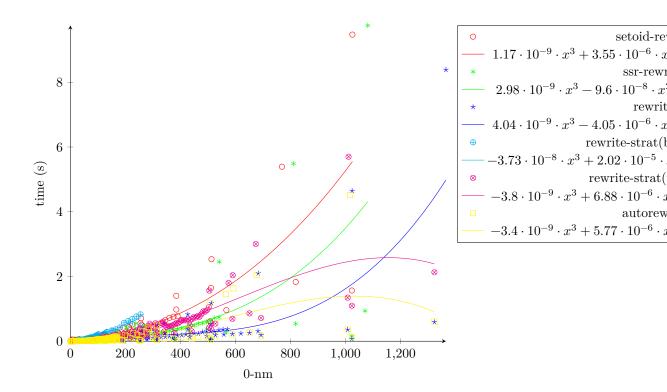
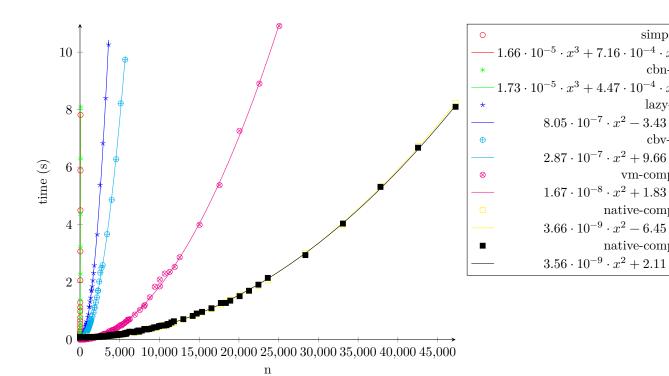
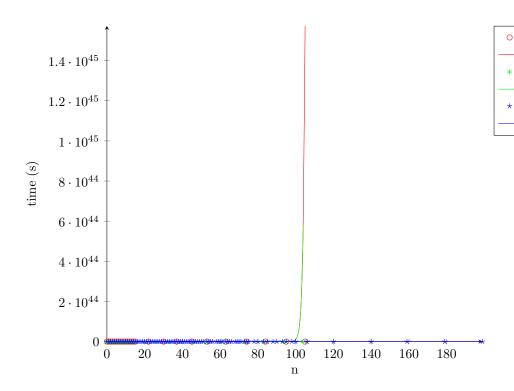


Figure 16: timing-rewrite-plus-0-tree param-1-n 0, param-2-m 1, param-3-input-size 5, param-4-output-size 3, param-5-num-rewrites 1



 $Figure\ 17:\ timing\mbox{-sieve-of-eratos} thenes$



rewrite

rewrite-

 $-1.23 \cdot 10^{-6} \cdot x^3 + 2.84 \cdot$

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

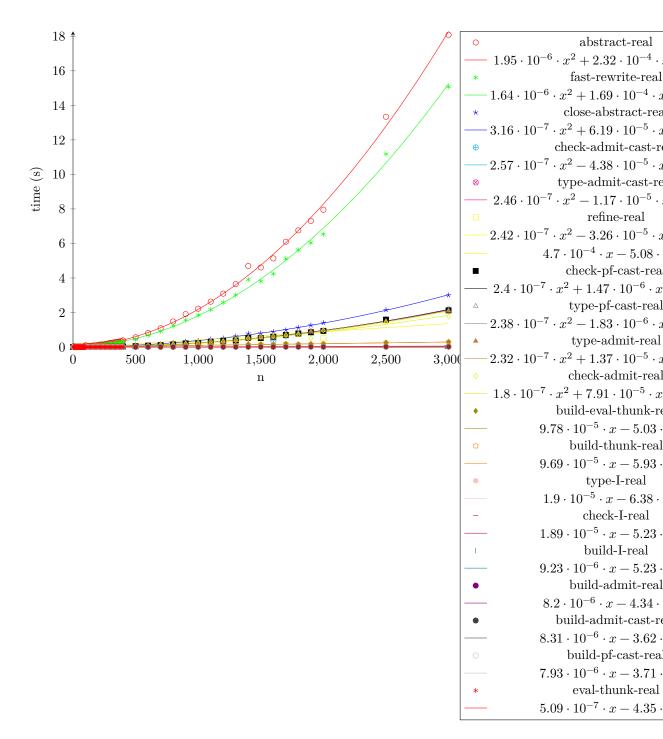


Figure 19: timing-rewrite-repeated-app-fast-rewrite-ltac2