

Figure 1: timing-pattern

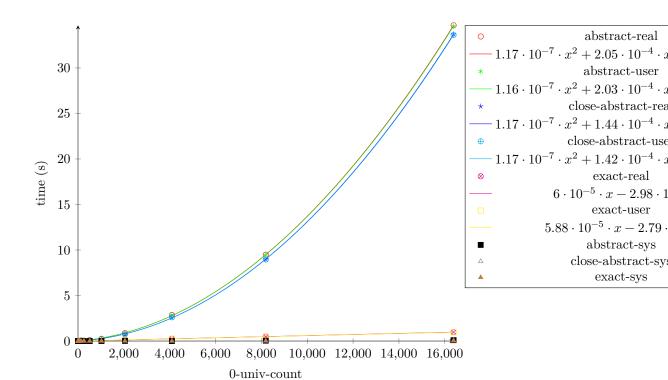


Figure 2: timing-n-polymorphic-universes param-1-n 0

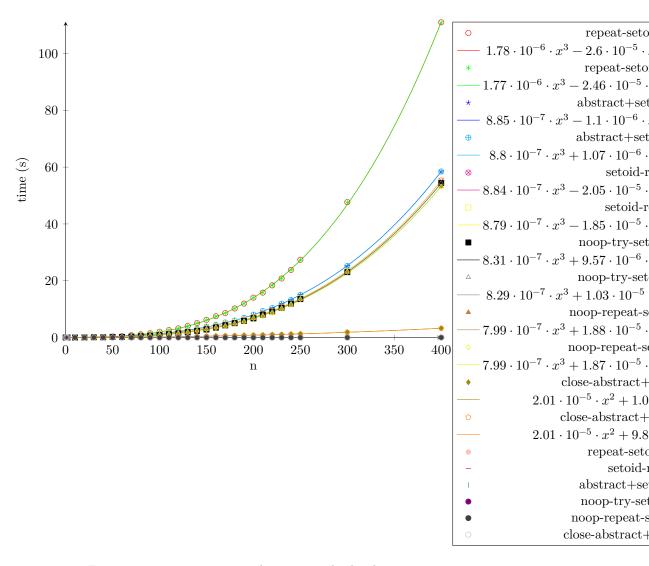


Figure 3: timing-repeat-setoid-rewrite-under-binders

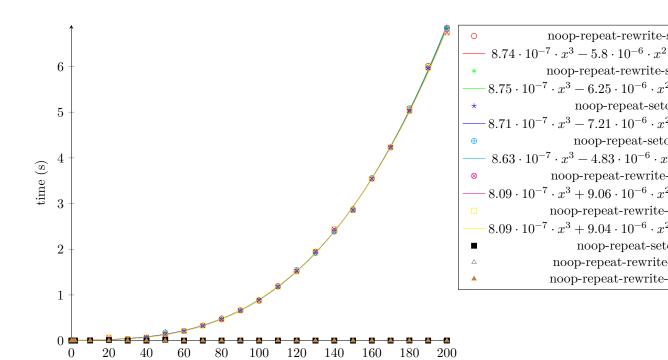


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

n

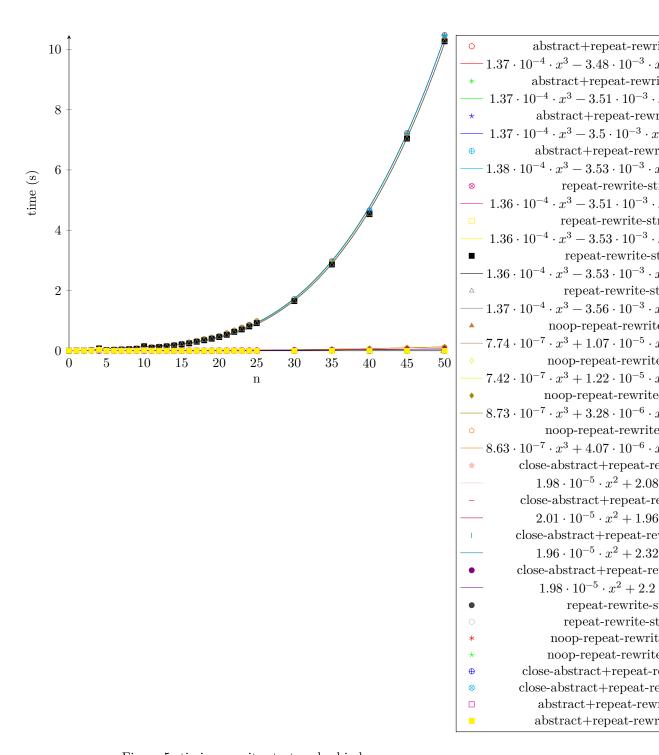


Figure 5: timing-rewrite-strat-under-binders

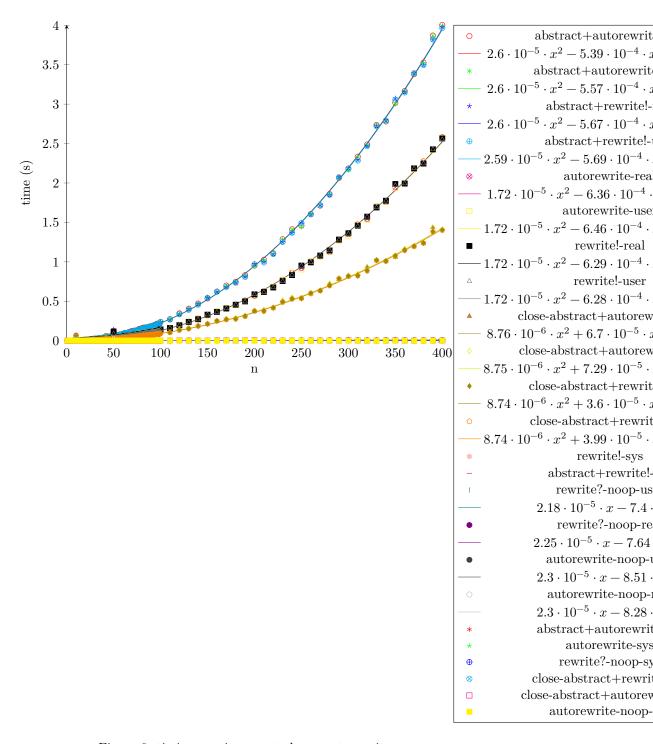


Figure 6: timing-rewrite-repeated-app-autorewrite

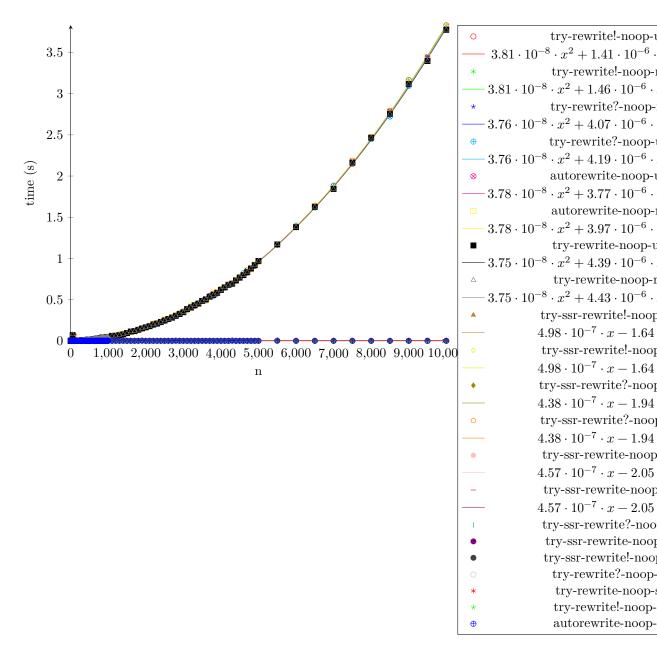
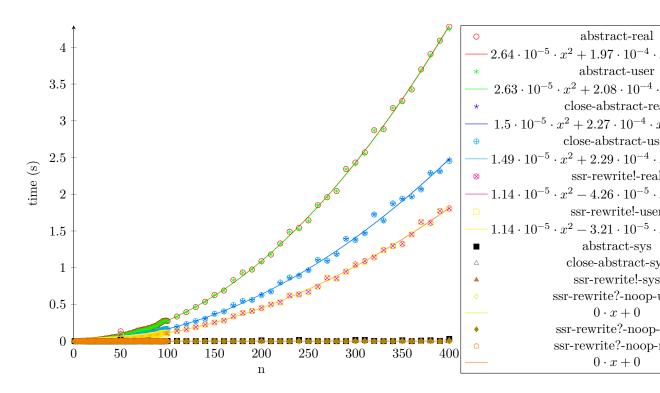


Figure 7: timing-rewrite-repeated-app-autorewrite-noop



 $Figure~8:~timing\mbox{-rewrite-repeated-app-ssrrewrite}$

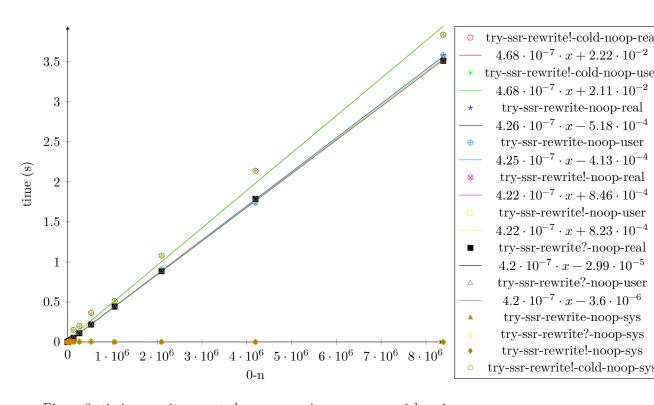


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn $\ 1$

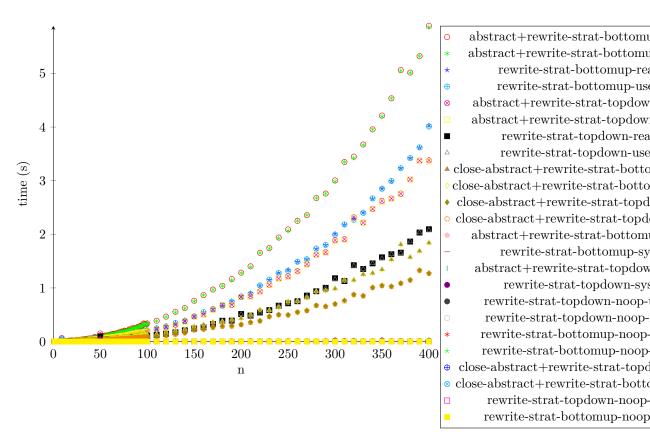
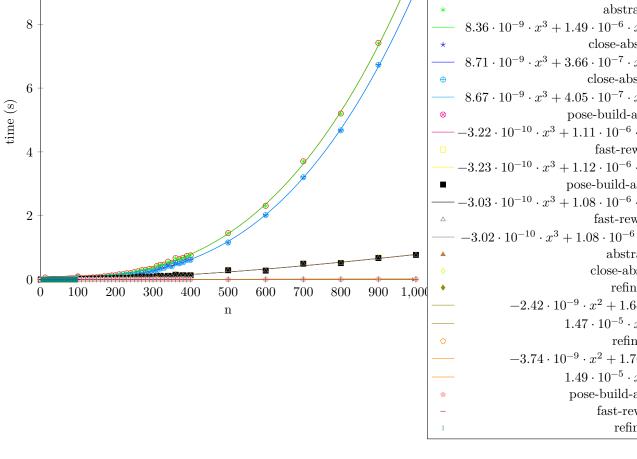


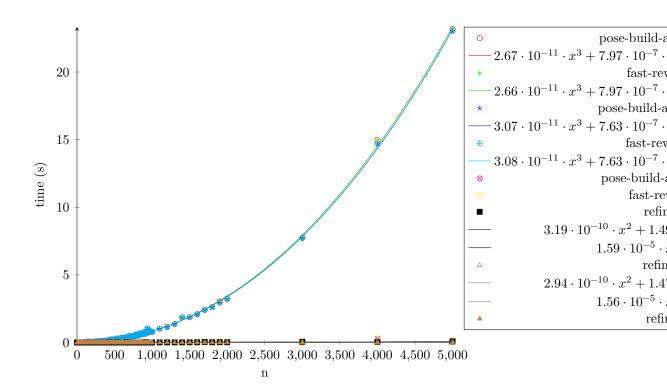
Figure 10: timing-rewrite-repeated-app-rewrite-strat



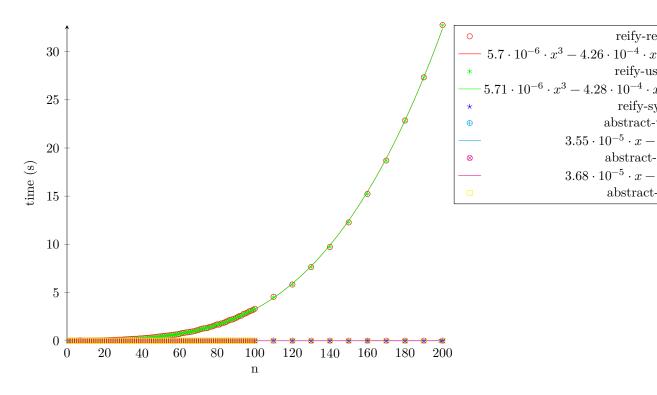
abstra

 $8.37 \cdot 10^{-9} \cdot x^3 + 1.5 \cdot 10^{-6} \cdot x$

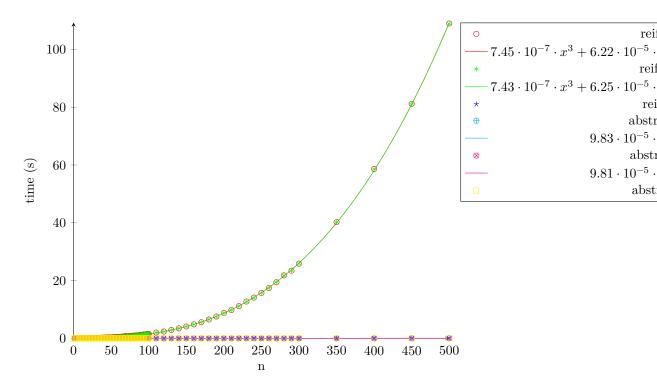
Figure 11: timing-rewrite-repeated-app-fast-rewrite



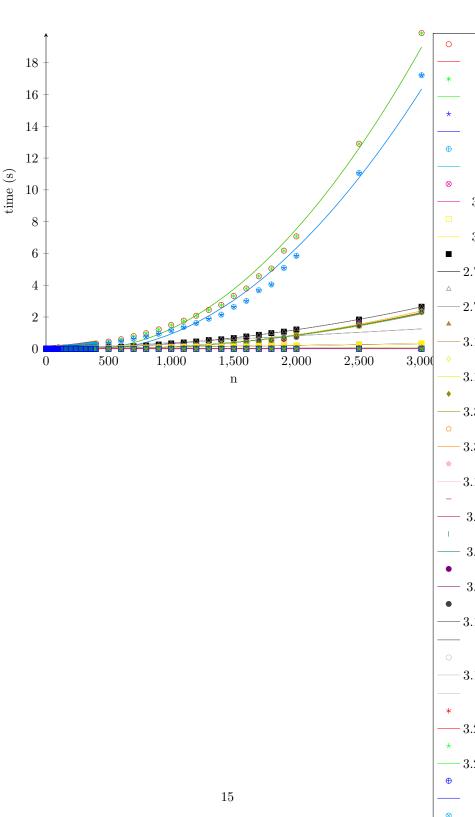
 $\label{prop:figure 12:timing-rewrite-repeated-app-fast-rewrite-no-abstract} Figure~12:~timing-rewrite-repeated-app-fast-rewrite-no-abstract$



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



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



 $2.58 \cdot 10^{-6} \cdot x^2 - 1.47 \cdot 10^{-6}$ $2.58 \cdot 10^{-6} \cdot x^2 - 1.47 \cdot 10^{-6}$ $2.3 \cdot 10^{-6} \cdot x^2 - 1.51 \cdot 10^{-3}$ $2.3 \cdot 10^{-6} \cdot x^2 - 1.52 \cdot 10^{-3}$ $3.63 \cdot 10^{-7} \cdot x^2 - 3 \cdot 10^{-4} \cdot x$ $3.62 \cdot 10^{-7} \cdot x^2 - 3 \cdot 10^{-4} \cdot x$ $2.79 \cdot 10^{-7} \cdot x^2 + 4.29 \cdot 10^{-5} \cdot x^2$ $2.79 \cdot 10^{-7} \cdot x^2 + 4.43 \cdot 10^{-5} \cdot x^2$ $3.17 \cdot 10^{-7} \cdot x^2 - 2.19 \cdot 10^{-4} \cdot x^2$ $3.17 \cdot 10^{-7} \cdot x^2 - 2.19 \cdot 10^{-4} \cdot x^2$ $3.36 \cdot 10^{-7} \cdot x^2 - 2.52 \cdot 10^{-4} \cdot x^2$ $3.36 \cdot 10^{-7} \cdot x^2 - 2.52 \cdot 10^{-4} \cdot x^2$ $3.17 \cdot 10^{-7} \cdot x^2 - 2.22 \cdot 10^{-4} \cdot x^2$ $3.17 \cdot 10^{-7} \cdot x^2 - 2.22 \cdot 10^{-4}$ $3.28 \cdot 10^{-7} \cdot x^2 - 2.4 \cdot 10^{-4} \cdot x$ $3.28 \cdot 10^{-7} \cdot x^2 - 2.4 \cdot 10^{-4} \cdot x$ $3.14 \cdot 10^{-7} \cdot x^2 - 2.18 \cdot 10^{-4} \cdot x^2$

abstract-real

abstract-user

fast-rewrite-real

fast-rewrite-user

check-pf-cast-rea

check-pf-cast-use

close-abstract-use

close-abstract-rea

check-admit-cast-u

check-admit-cast-r

type-admit-real

type-admit-user

type-pf-cast-user

type-pf-cast-real

check-admit-user

check-admit-real

refine-real

 $4.35 \cdot 10^{-4} \cdot x - 5.18 \cdot$ refine-user

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