

Figure 1: timing-pattern

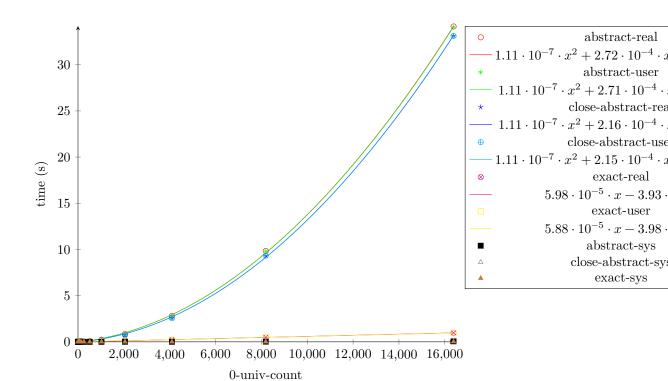


Figure 2: timing-n-polymorphic-universes param-1-n 0

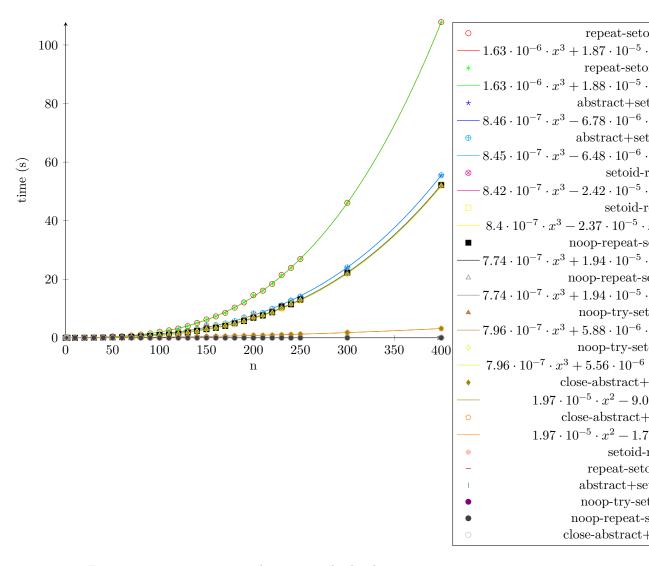


Figure 3: timing-repeat-setoid-rewrite-under-binders

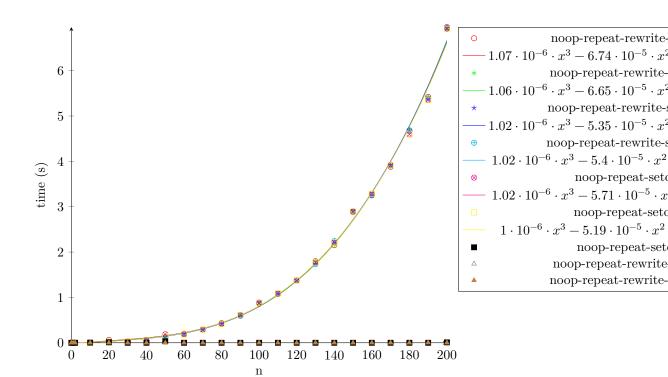


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

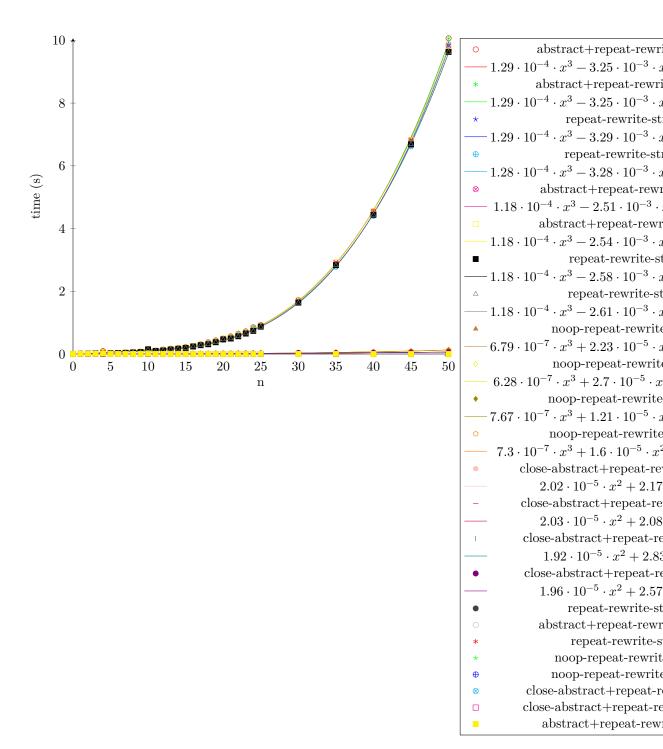
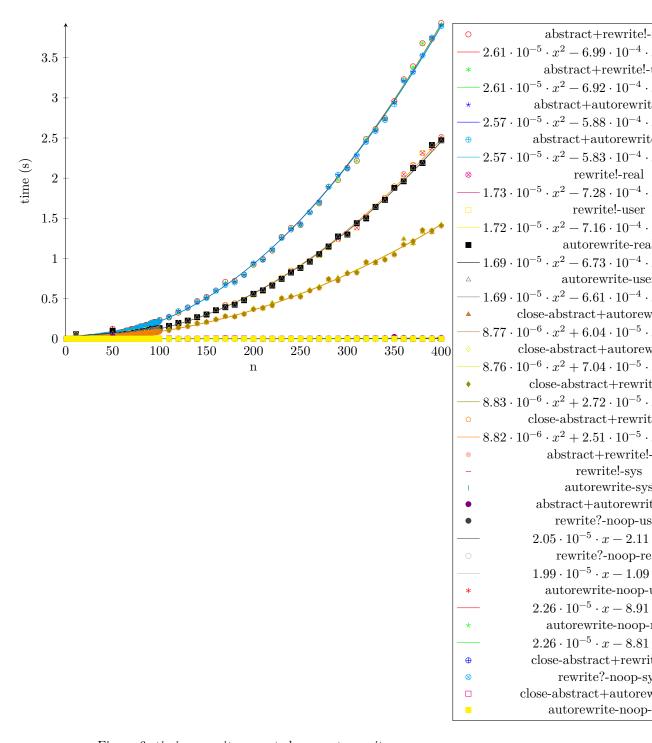


Figure 5: timing-rewrite-strat-under-binders



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

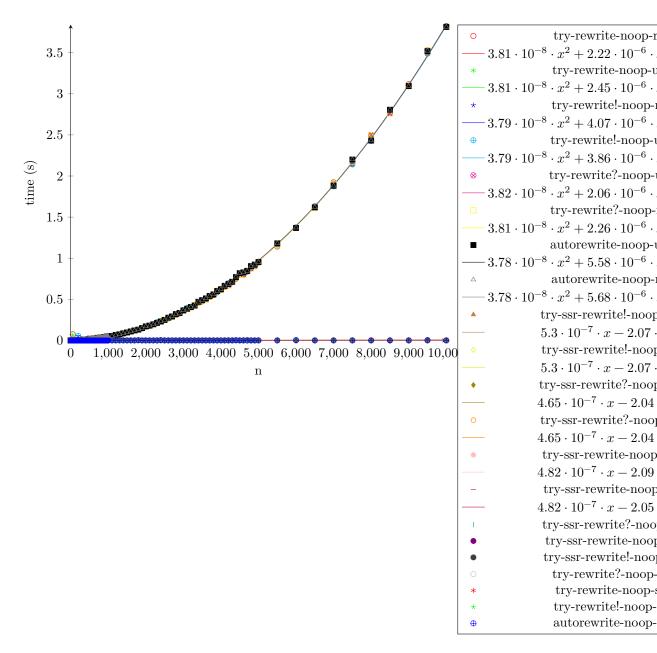
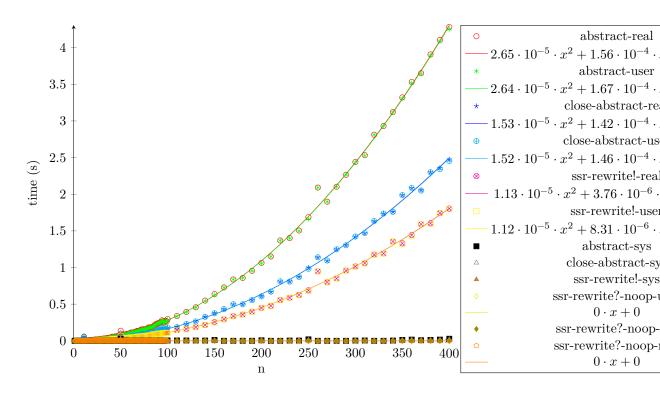


Figure 7: timing-rewrite-repeated-app-autorewrite-noop



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

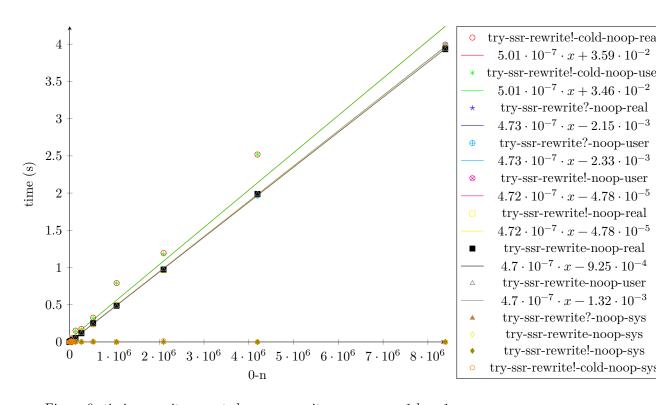


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn $\ 1$

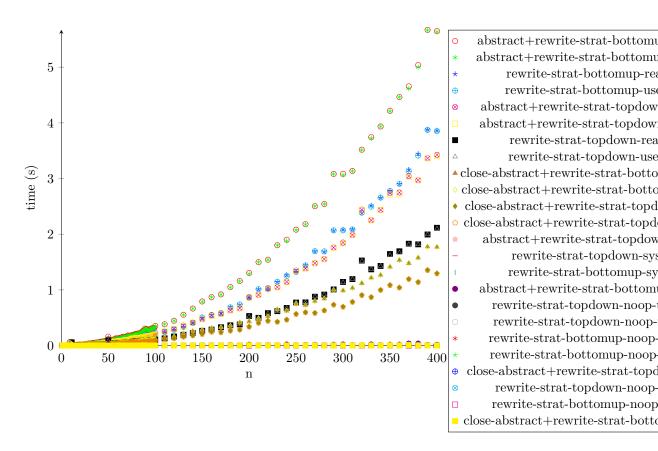
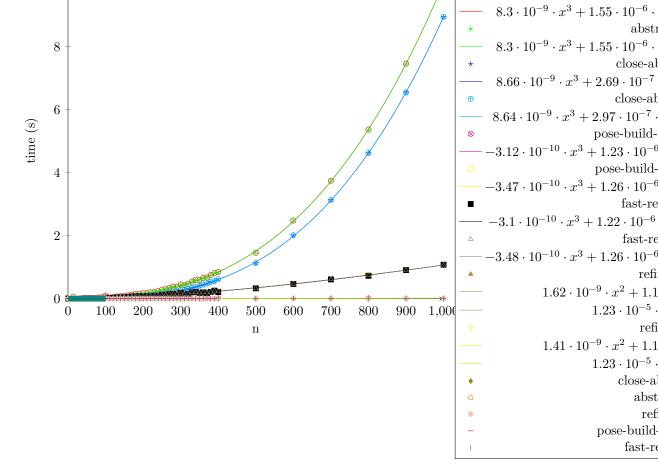


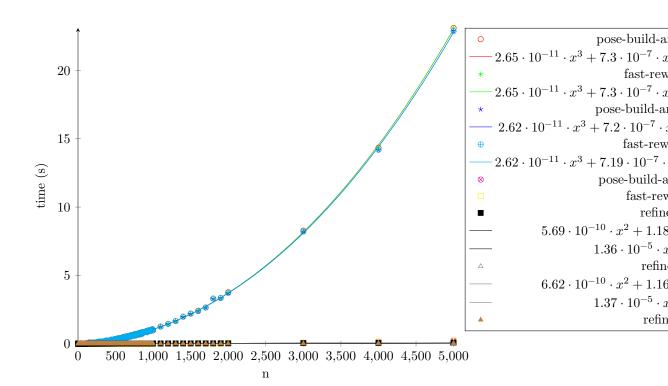
Figure 10: timing-rewrite-repeated-app-rewrite-strat



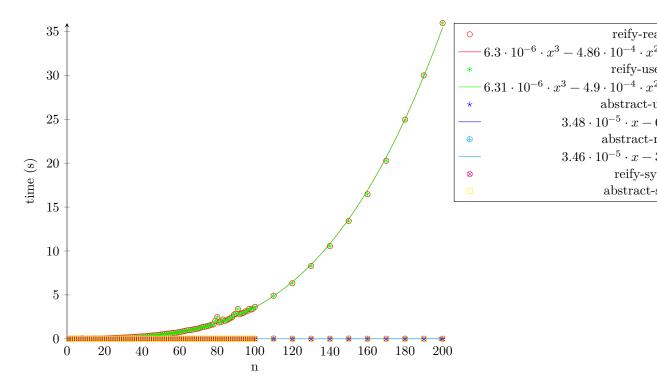
abst

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

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



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

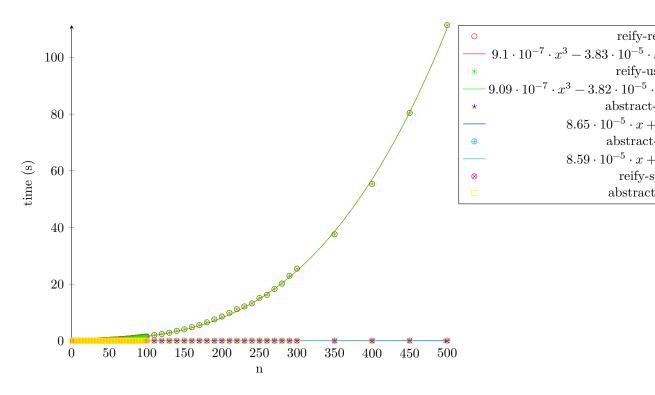
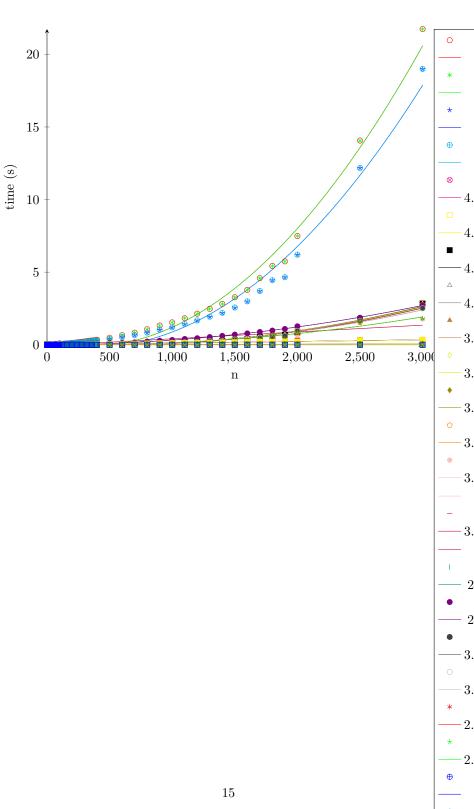


Figure 14: timing-typeclass-reification-let-in-PHOAS



 $2.89 \cdot 10^{-6} \cdot x^2 - 1.87 \cdot 10^{-6}$ $2.89 \cdot 10^{-6} \cdot x^2 - 1.87 \cdot 10^{-6}$ $2.6\cdot 10^{-6}\cdot x^2 - 1.9\cdot 10^{-3}$ $2.6\cdot 10^{-6}\cdot x^2 - 1.9\cdot 10^{-3}$ $4.06 \cdot 10^{-7} \cdot x^2 - 3.43 \cdot 10^{-4} \cdot x^2$ $4.06 \cdot 10^{-7} \cdot x^2 - 3.44 \cdot 10^{-4} \cdot x^2$ $4.04 \cdot 10^{-7} \cdot x^2 - 3.44 \cdot 10^{-4} \cdot x^2$ $4.04 \cdot 10^{-7} \cdot x^2 - 3.43 \cdot 10^{-4} \cdot x^2$ $3.94 \cdot 10^{-7} \cdot x^2 - 3.29 \cdot 10^{-4} \cdot x^2$ $3.94 \cdot 10^{-7} \cdot x^2 - 3.29 \cdot 10^{-4} \cdot x^2$ $3.86 \cdot 10^{-7} \cdot x^2 - 3.25 \cdot 10^{-4} \cdot x^2$ $3.86 \cdot 10^{-7} \cdot x^2 - 3.25 \cdot 10^{-4} \cdot x^2$ $3.94 \cdot 10^{-7} \cdot x^2 - 3.49 \cdot 10^{-4} \cdot x^2$ $3.94 \cdot 10^{-7} \cdot x^2 - 3.49 \cdot 10^{-4} \cdot x^2$ $2.9 \cdot 10^{-7} \cdot x^2 + 3.38 \cdot 10^{-5} \cdot x$ $2.9 \cdot 10^{-7} \cdot x^2 + 3.43 \cdot 10^{-5} \cdot x$ $3.56 \cdot 10^{-7} \cdot x^2 - 2.74 \cdot 10^{-4} \cdot x^2$ $3.56 \cdot 10^{-7} \cdot x^2 - 2.74 \cdot 10^{-4} \cdot x^2$ $2.55 \cdot 10^{-7} \cdot x^2 - 1.27 \cdot 10^{-4} \cdot x^2$ $2.55 \cdot 10^{-7} \cdot x^2 - 1.27 \cdot 10^{-4} \cdot x^2$

 $1.16 \cdot 10^{-4} \cdot x - 6.9$

 $1.15 \cdot 10^{-4} \cdot x - 7.59$ build-eval-thunk-u $1.15 \cdot 10^{-4} \cdot x - 7.05 \cdot$

abstract-real

abstract-user

fast-rewrite-real

fast-rewrite-user

check-pf-cast-rea

check-pf-cast-use

type-pf-cast-user

type-pf-cast-real

type-admit-user

type-admit-real

type-admit-cast-us

type-admit-cast-re

 $4.7 \cdot 10^{-4} \cdot x - 5.79 \cdot$ refine-user

 $4.7 \cdot 10^{-4} \cdot x - 5.8 \cdot 10^{-4}$ close-abstract-rea

close-abstract-use

check-admit-cast-u

check-admit-cast-r

check-admit-user

check-admit-real

build-eval-thunk-re

build-thunk-real

build-thunk-user

refine-real

 $1.14 \cdot 10^{-4} \cdot x - 7.78 \cdot$ ob ools I see