

Figure 1: timing-pattern

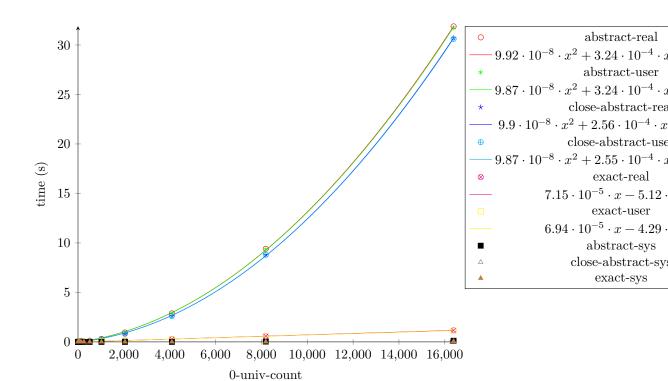


Figure 2: timing-n-polymorphic-universes param-1-n 0

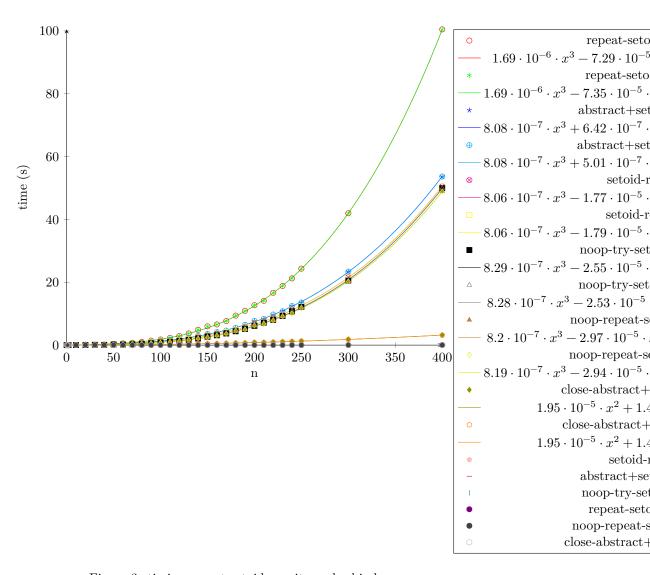
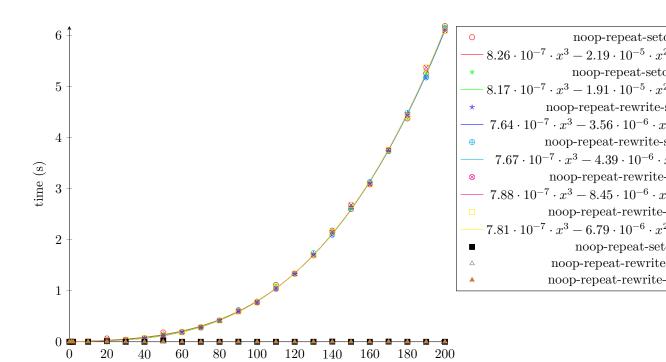


Figure 3: timing-repeat-setoid-rewrite-under-binders



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

n

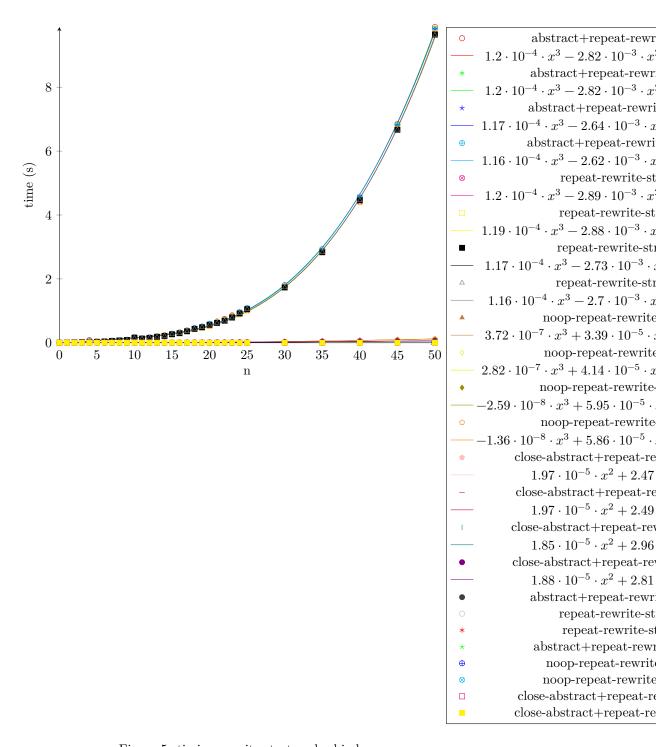
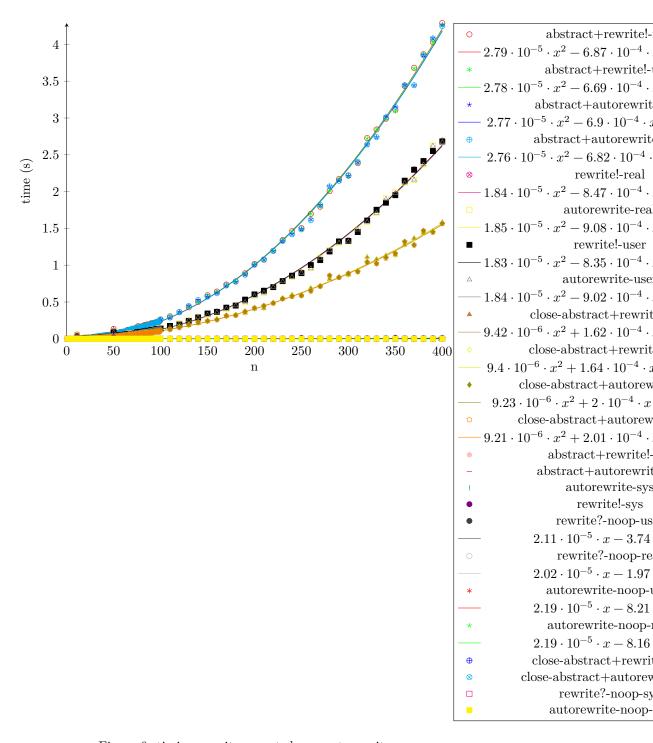


Figure 5: timing-rewrite-strat-under-binders



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

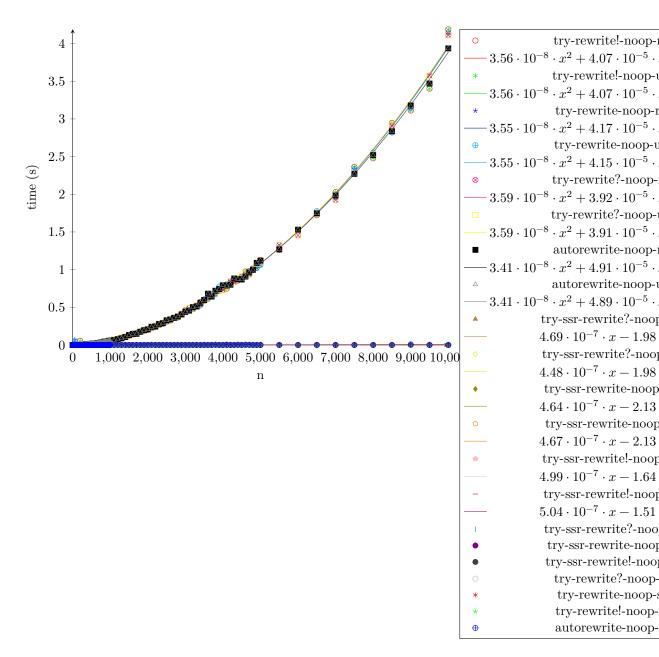
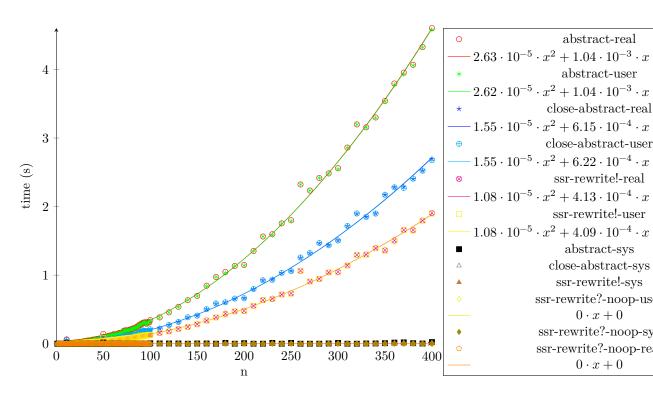


Figure 7: timing-rewrite-repeated-app-autorewrite-noop



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

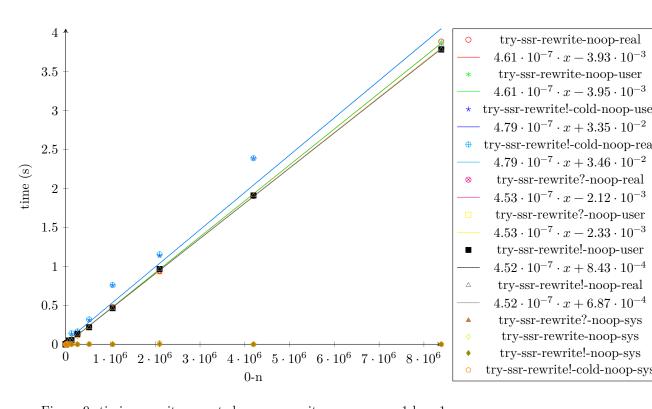


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn $\ 1$

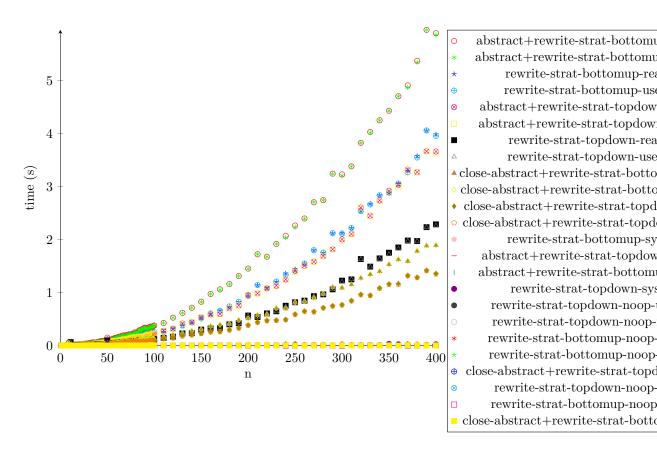
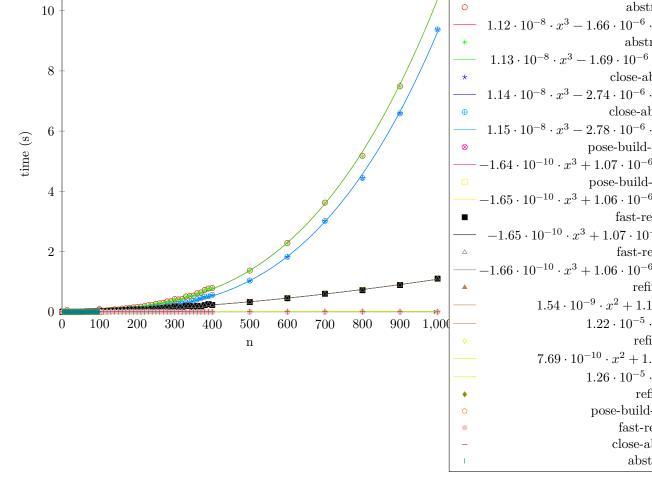
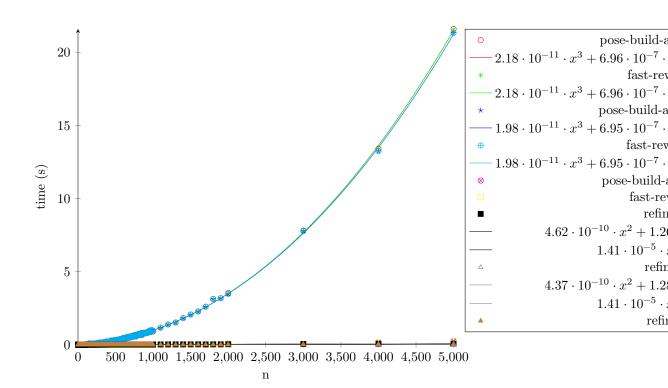


Figure 10: timing-rewrite-repeated-app-rewrite-strat

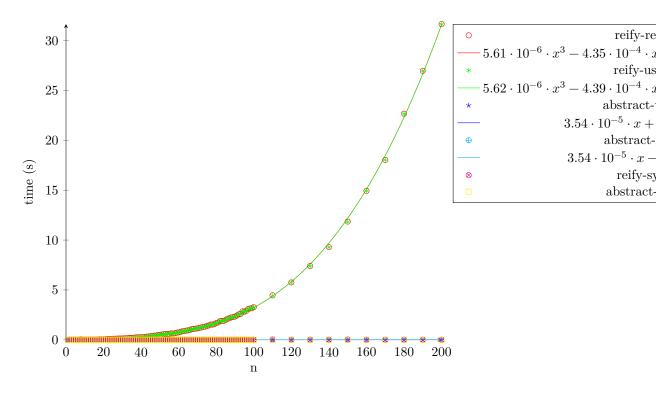


abst

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



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



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

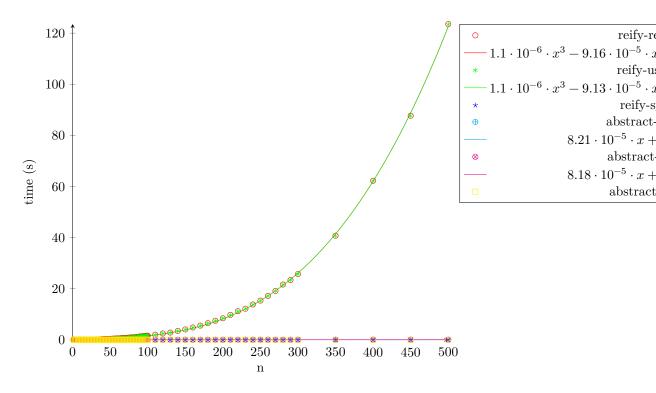
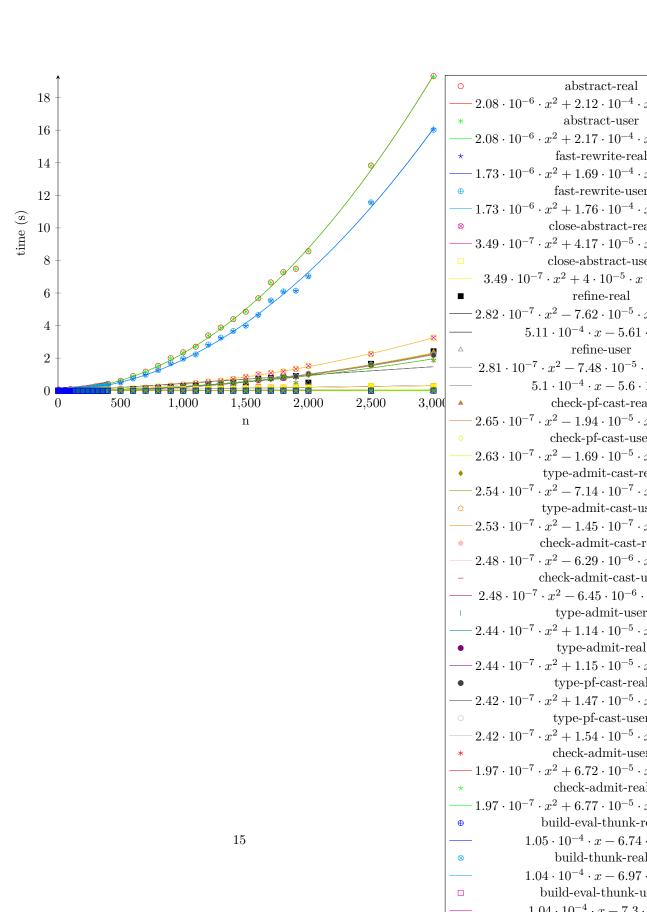


Figure 14: timing-typeclass-reification-let-in-PHOAS



abstract-real

abstract-user

fast-rewrite-real

fast-rewrite-user

close-abstract-rea

close-abstract-use

 $5.11 \cdot 10^{-4} \cdot x - 5.61 \cdot$ refine-user

 $5.1 \cdot 10^{-4} \cdot x - 5.6 \cdot 1$

check-pf-cast-rea

check-pf-cast-use

type-admit-cast-re

type-admit-cast-us

check-admit-cast-r

check-admit-cast-u

type-admit-user

type-admit-real

type-pf-cast-real

type-pf-cast-user

check-admit-user

check-admit-real

build-eval-thunk-re

 $1.05 \cdot 10^{-4} \cdot x - 6.74 \cdot$ build-thunk-real $1.04 \cdot 10^{-4} \cdot x - 6.97 \cdot$ build-eval-thunk-u $1.04 \cdot 10^{-4} \cdot x - 7.3$ build-thunk-user $1.03 \cdot 10^{-4} \cdot x - 7.63 \cdot$ trong I magn

refine-real