

Figure 1: timing-pattern

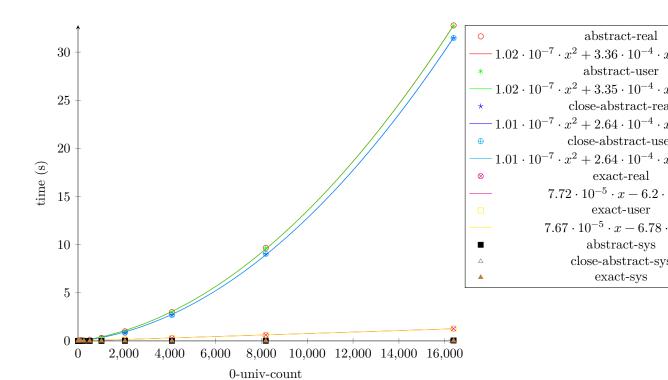


Figure 2: timing-n-polymorphic-universes param-1-n 0

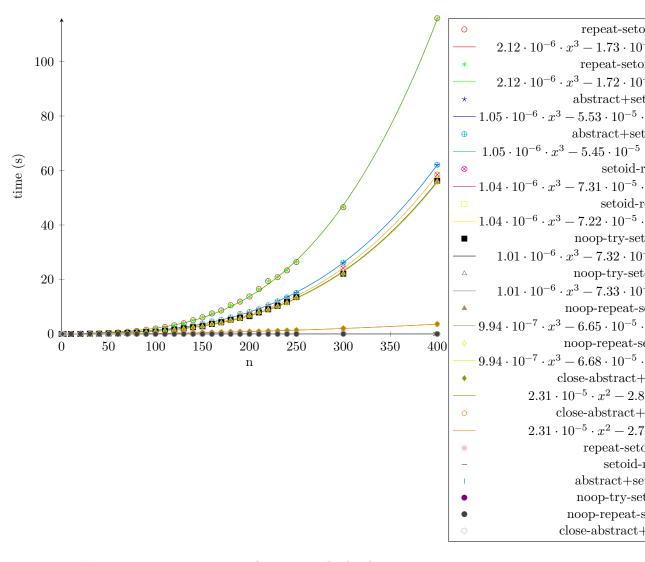


Figure 3: timing-repeat-setoid-rewrite-under-binders

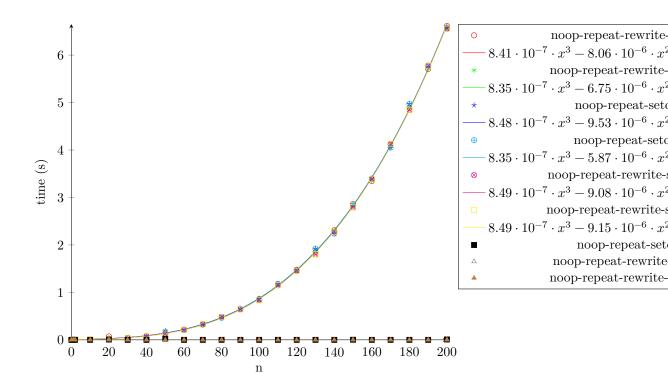


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

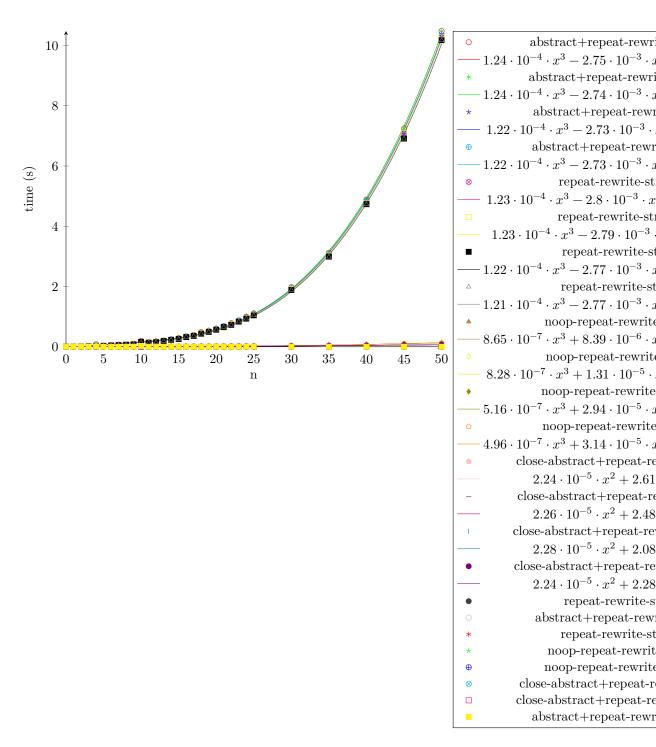


Figure 5: timing-rewrite-strat-under-binders

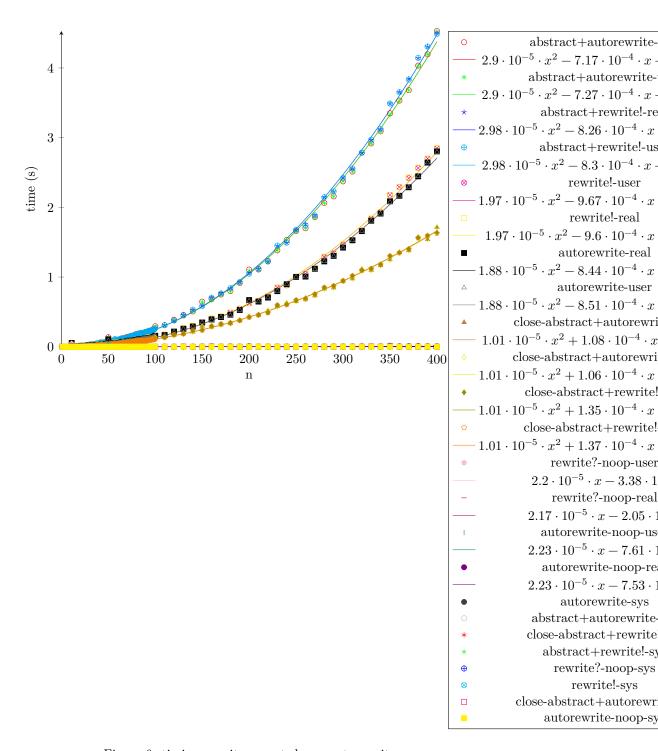


Figure 6: timing-rewrite-repeated-app-autorewrite

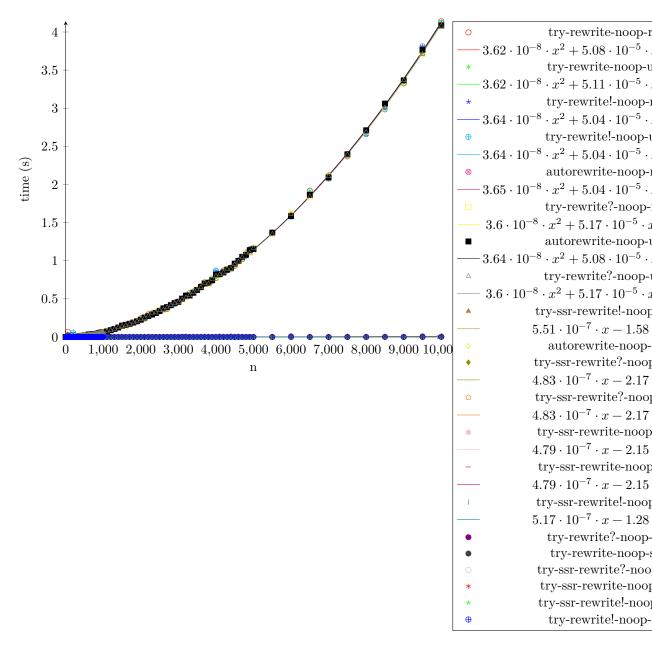


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

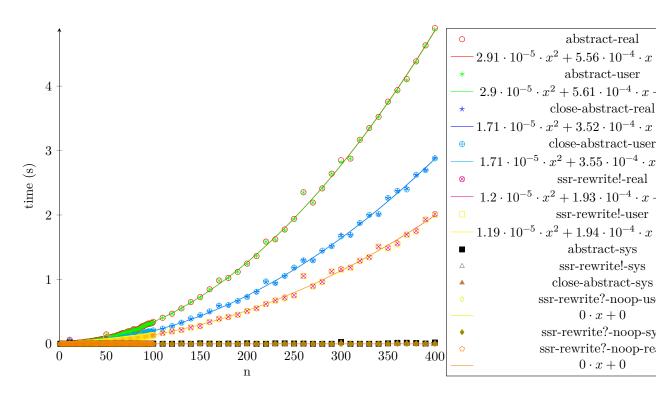


Figure 8: timing-rewrite-repeated-app-ssrrewrite

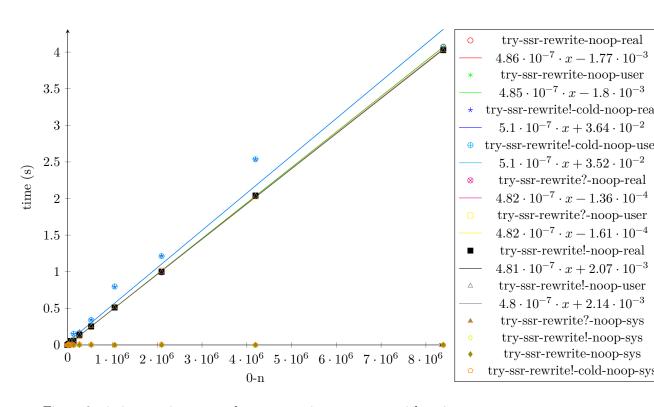


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn  $\ 1$ 

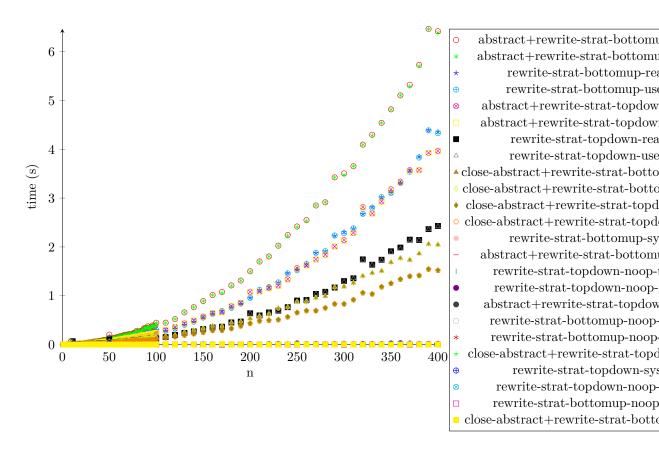


Figure 10: timing-rewrite-repeated-app-rewrite-strat

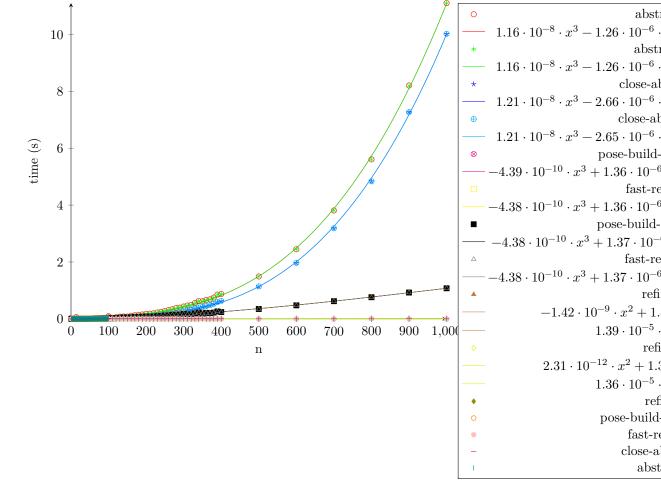
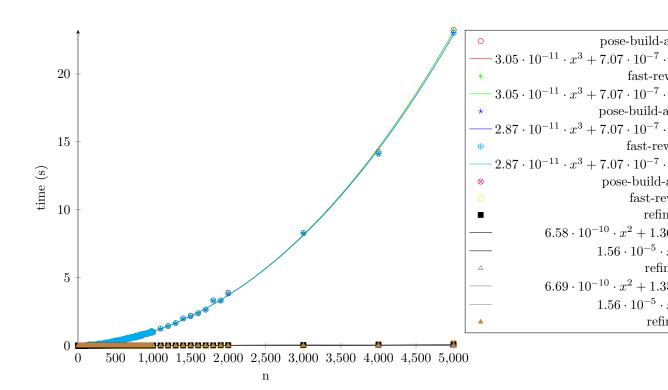


Figure 11: timing-rewrite-repeated-app-fast-rewrite



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

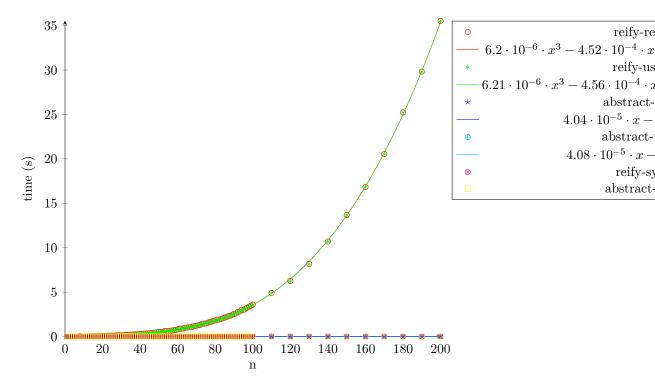
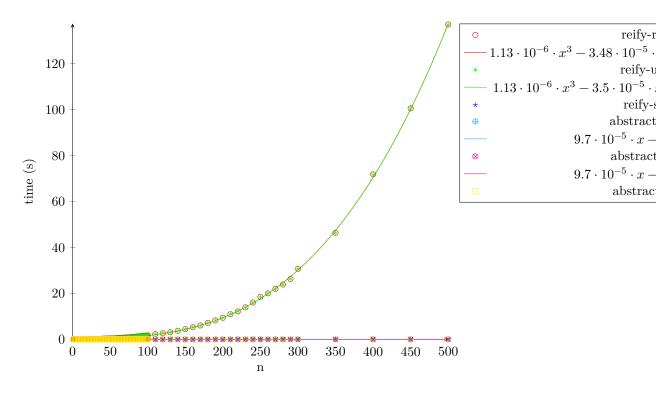
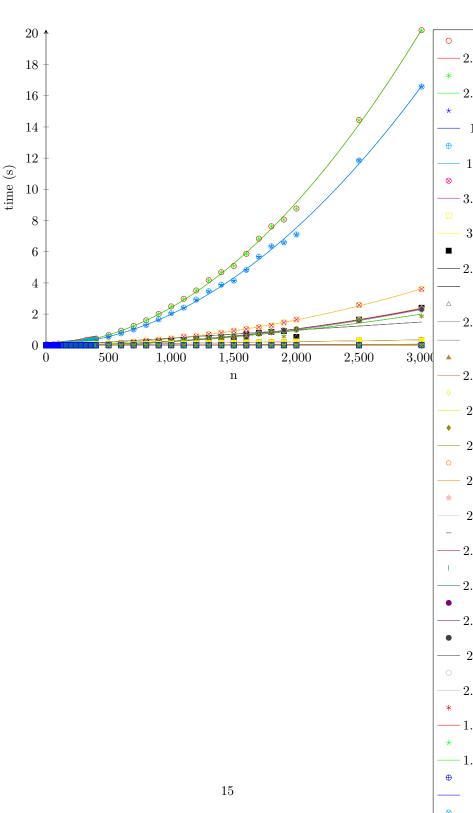


Figure 13: timing-typeclass-reification-let-in-HOAS



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



abstract-real

abstract-user

fast-rewrite-real

fast-rewrite-user

close-abstract-rea

close-abstract-use

refine-real

 $5.15 \cdot 10^{-4} \cdot x - 5.57$ refine-user

 $5.14 \cdot 10^{-4} \cdot x - 5.57 \cdot$ 

check-pf-cast-rea

check-pf-cast-use

type-admit-user

type-admit-real

type-pf-cast-real

type-pf-cast-user

type-admit-cast-re

type-admit-cast-us

check-admit-cast-u

check-admit-cast-r

check-admit-user

check-admit-real

build-eval-thunk-re

 $1.13 \cdot 10^{-4} \cdot x - 6.52$