

Figure 1: timing-pattern

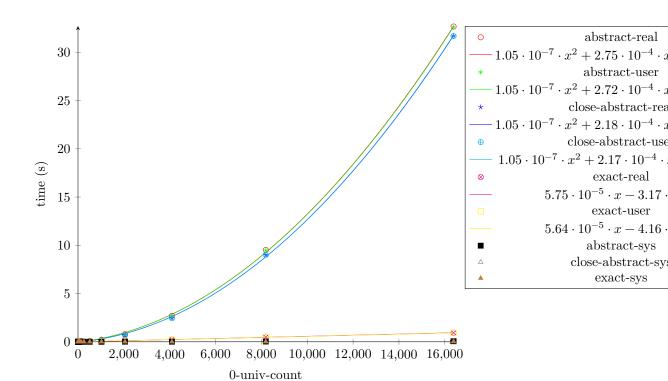


Figure 2: timing-n-polymorphic-universes param-1-n 0

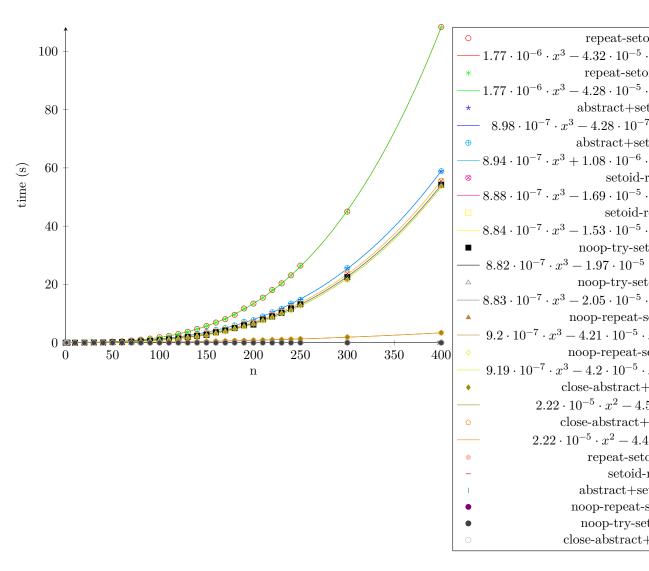


Figure 3: timing-repeat-setoid-rewrite-under-binders

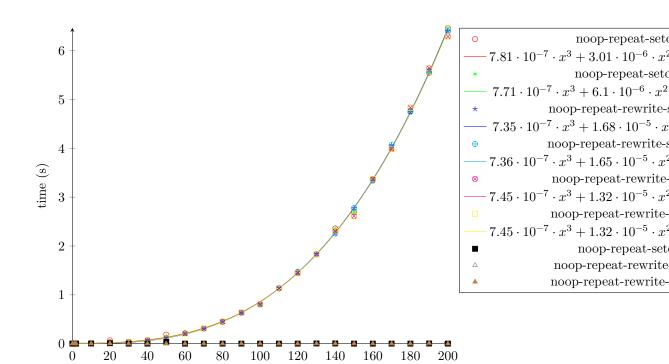


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

n

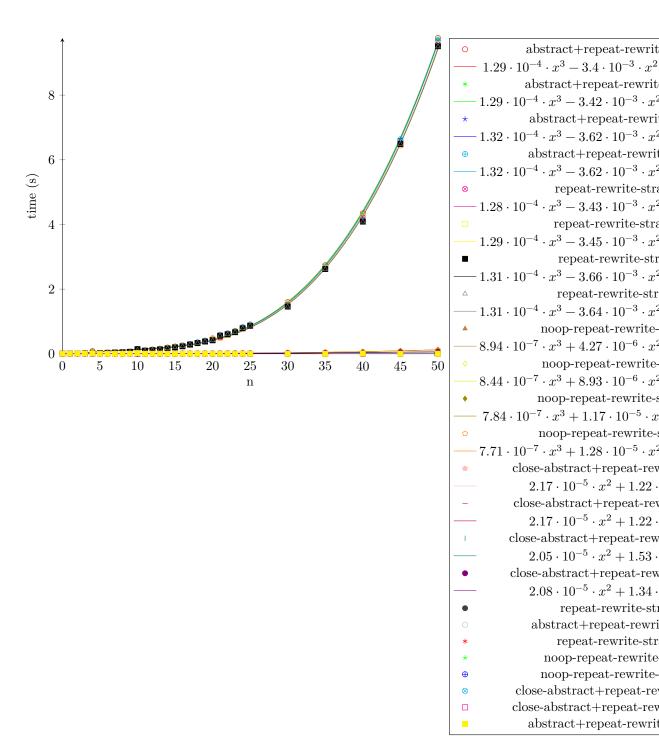


Figure 5: timing-rewrite-strat-under-binders

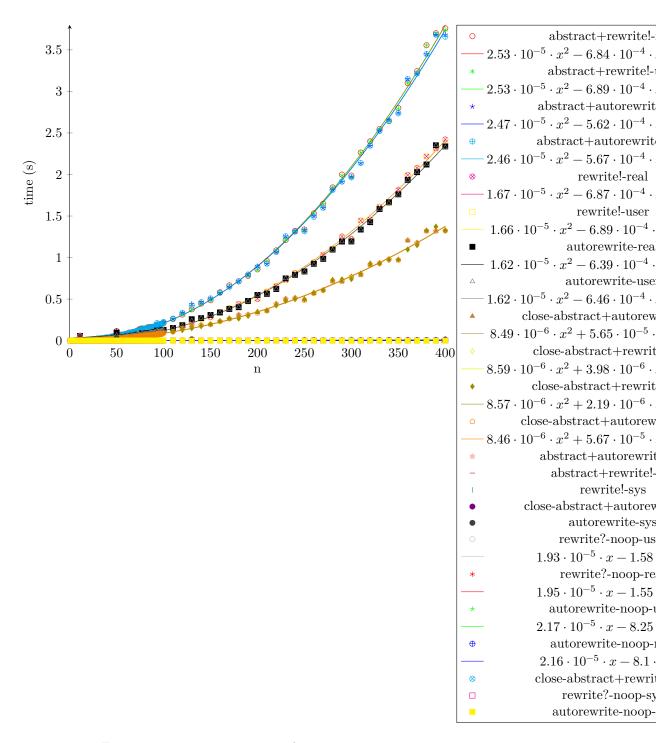


Figure 6: timing-rewrite-repeated-app-autorewrite

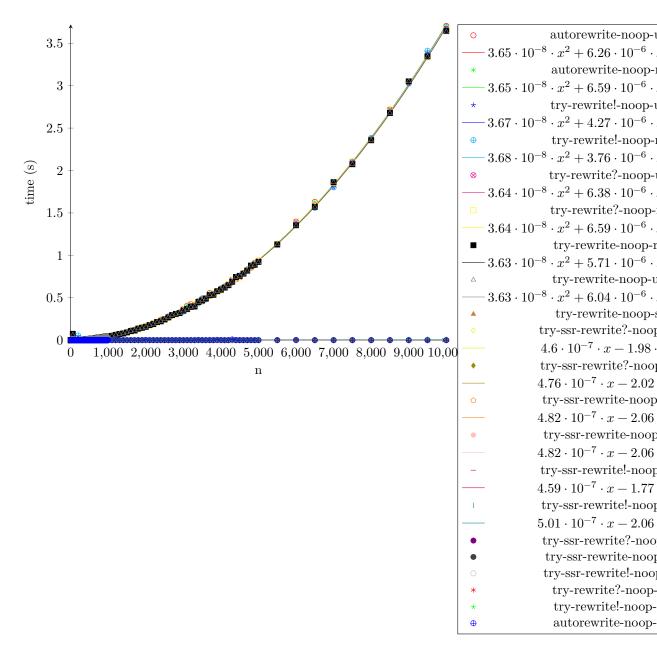


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

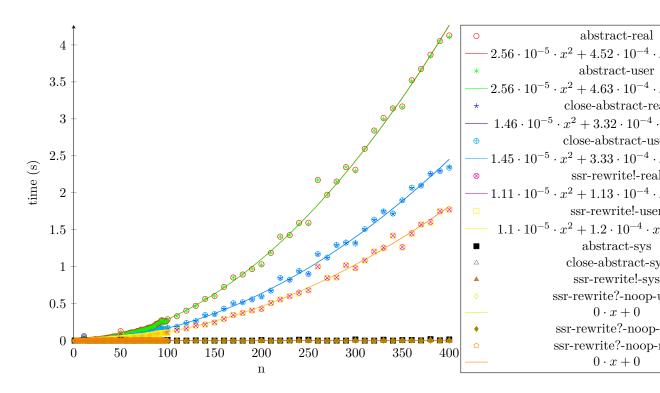


Figure 8: timing-rewrite-repeated-app-ssrrewrite

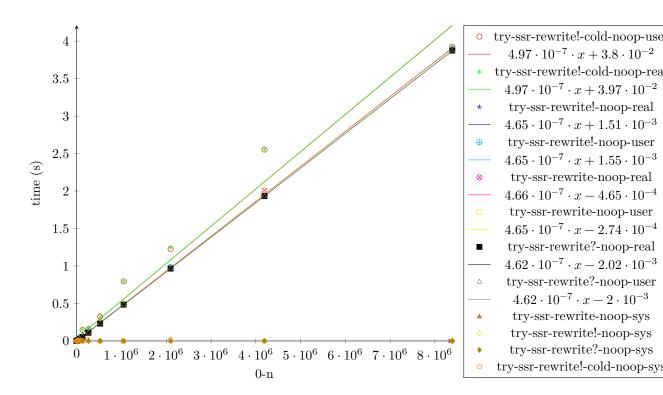


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn  $\ 1$ 

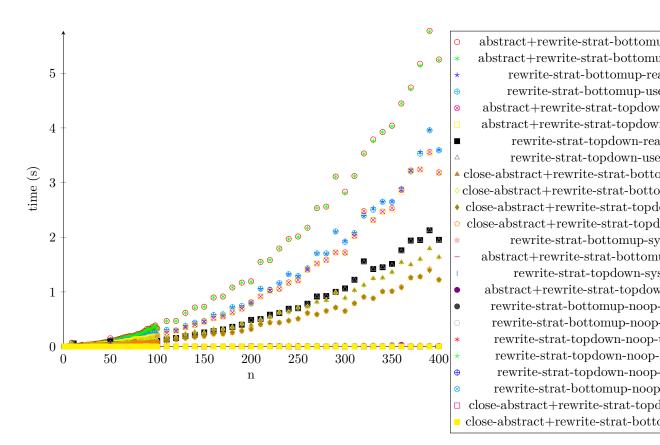
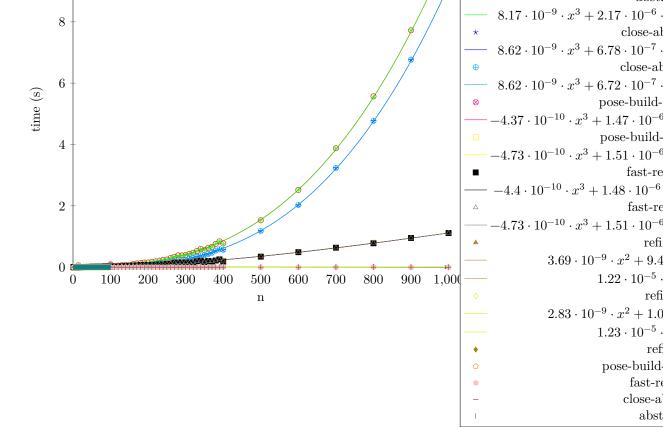


Figure 10: timing-rewrite-repeated-app-rewrite-strat

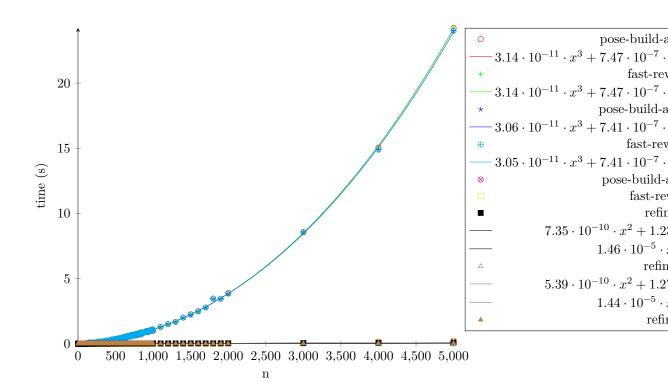


abst

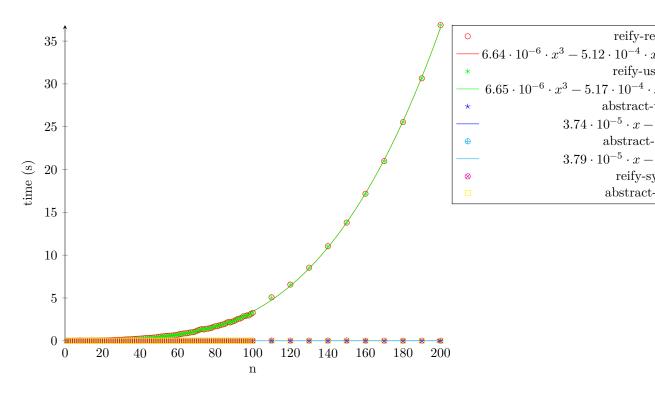
 $8.13 \cdot 10^{-9} \cdot x^3 + 2.22 \cdot 10^{-6}$ 

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

10



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



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

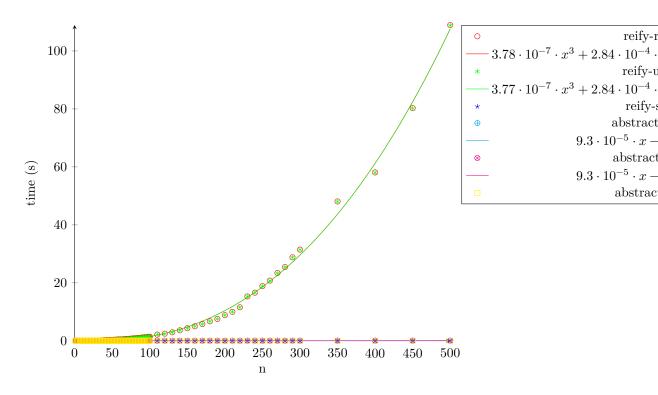
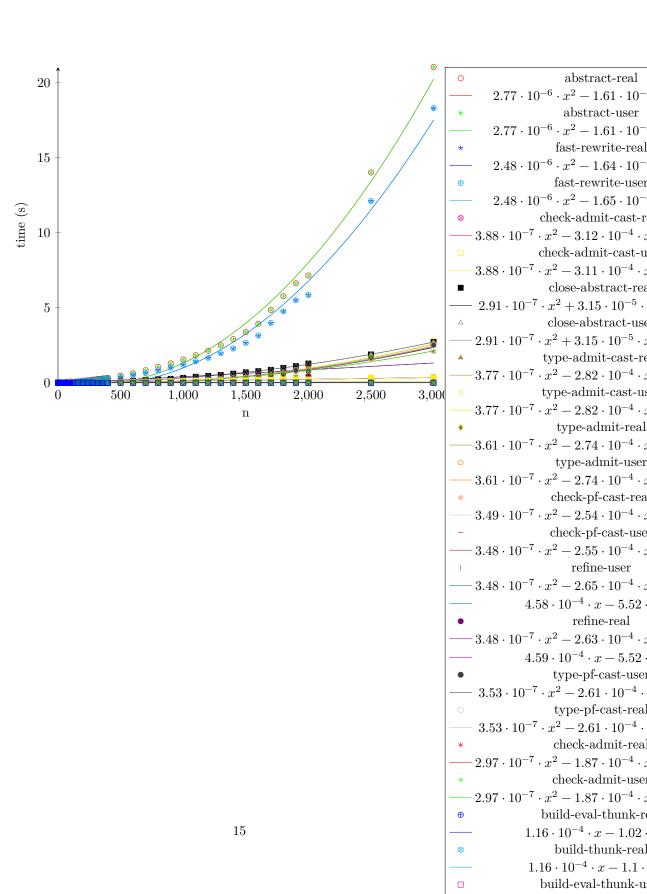


Figure 14: timing-typeclass-reification-let-in-PHOAS



abstract-real

abstract-user

fast-rewrite-real

fast-rewrite-user

check-admit-cast-r

check-admit-cast-u

close-abstract-rea

close-abstract-use

type-admit-cast-re

type-admit-cast-us

type-admit-real

type-admit-user

check-pf-cast-rea

check-pf-cast-use

refine-user

 $4.58 \cdot 10^{-4} \cdot x - 5.52 \cdot$ refine-real

 $4.59 \cdot 10^{-4} \cdot x - 5.52 \cdot$ type-pf-cast-user

type-pf-cast-real

check-admit-real

check-admit-user

build-eval-thunk-re

 $1.16 \cdot 10^{-4} \cdot x - 1.02 \cdot$ build-thunk-real  $1.16 \cdot 10^{-4} \cdot x - 1.1 \cdot$ build-eval-thunk-u  $1.16 \cdot 10^{-4} \cdot x - 1.12 \cdot$ build-thunk-user  $1.15 \cdot 10^{-4} \cdot x - 1.19 \cdot$