

pattern-user

Figure 1: timing-pattern

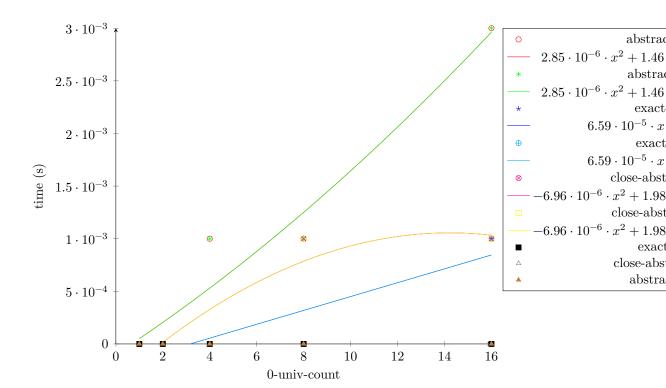


Figure 2: timing-n-polymorphic-universes param-1-n  $\,0\,$ 

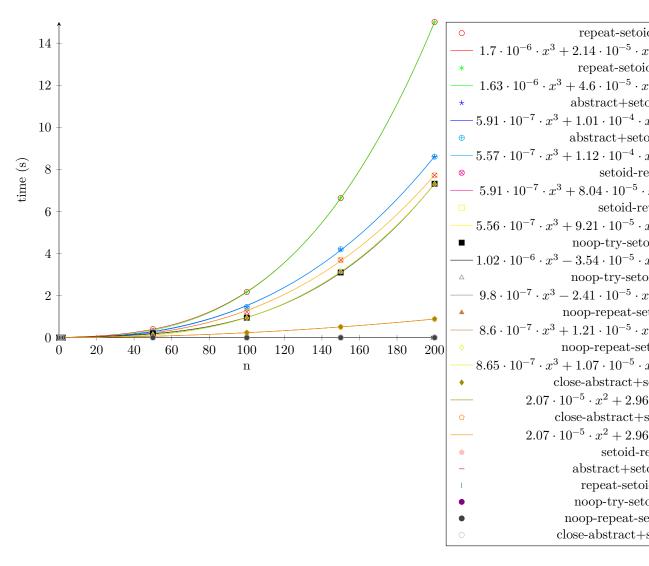
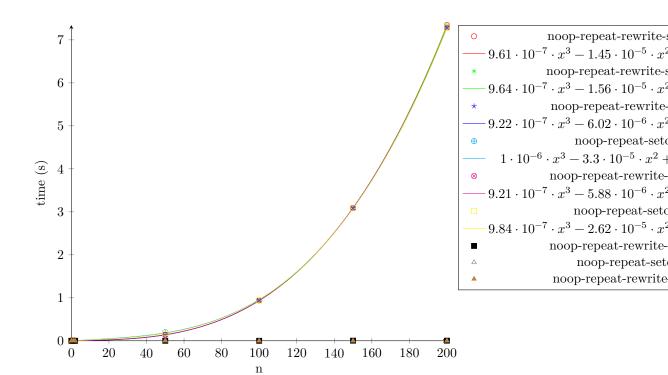


Figure 3: timing-repeat-setoid-rewrite-under-binders



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

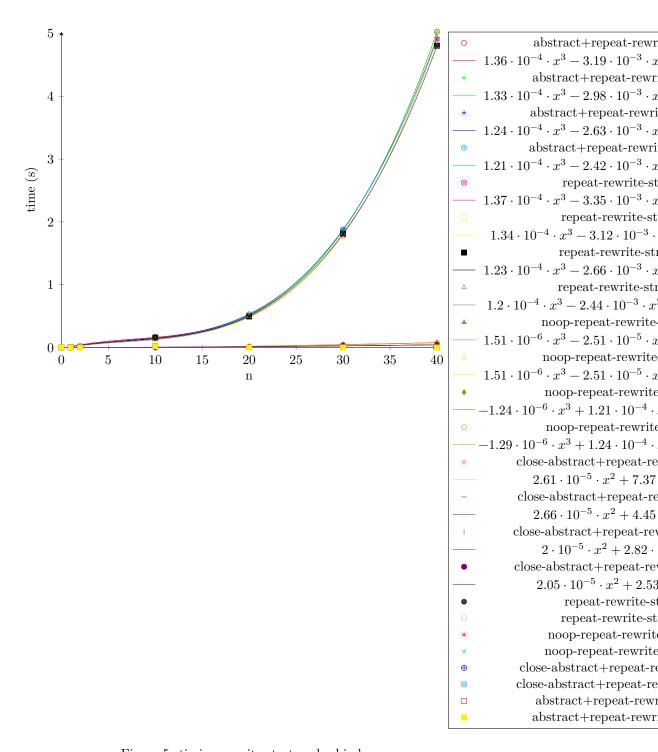


Figure 5: timing-rewrite-strat-under-binders

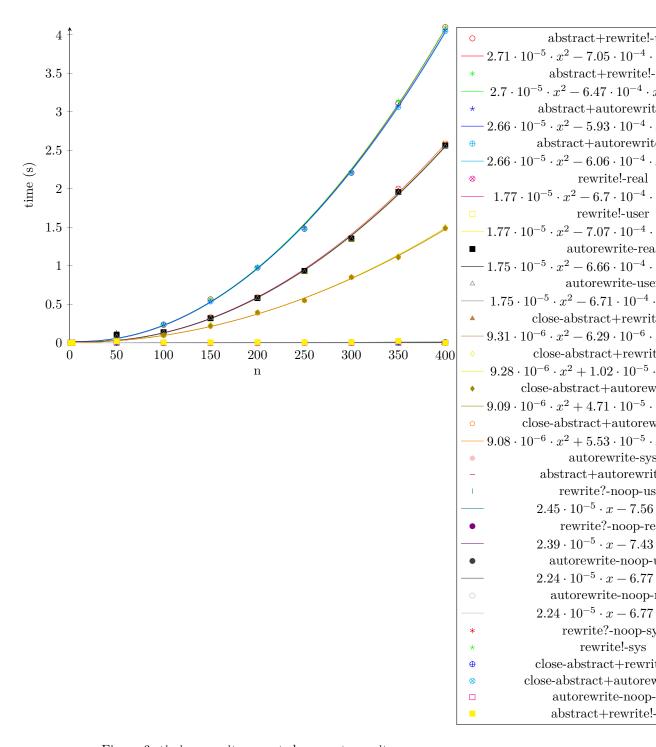


Figure 6: timing-rewrite-repeated-app-autorewrite

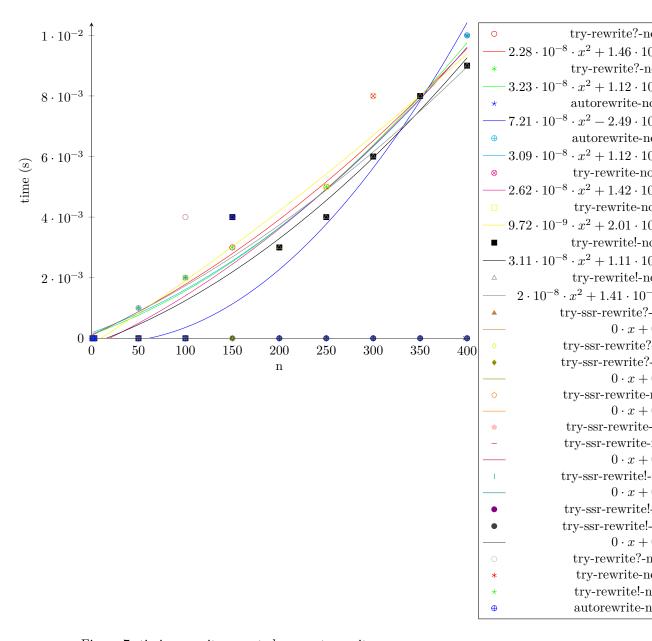


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

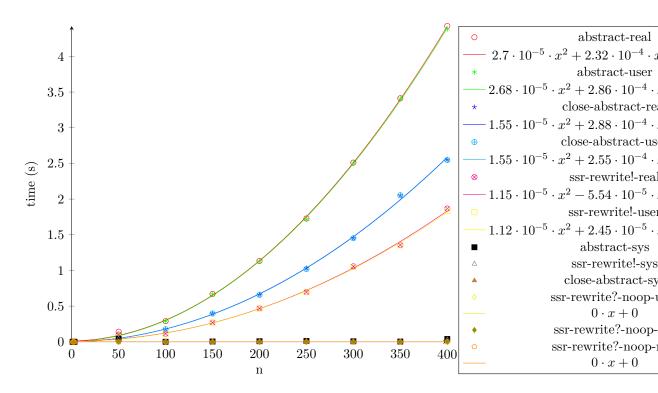


Figure 8: timing-rewrite-repeated-app-ssrrewrite

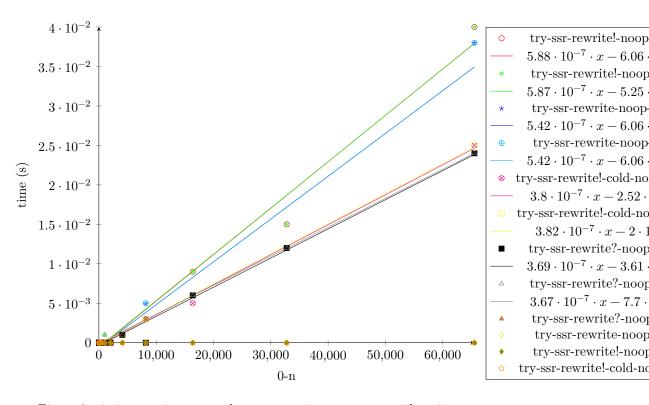


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn  $\,1\,$ 

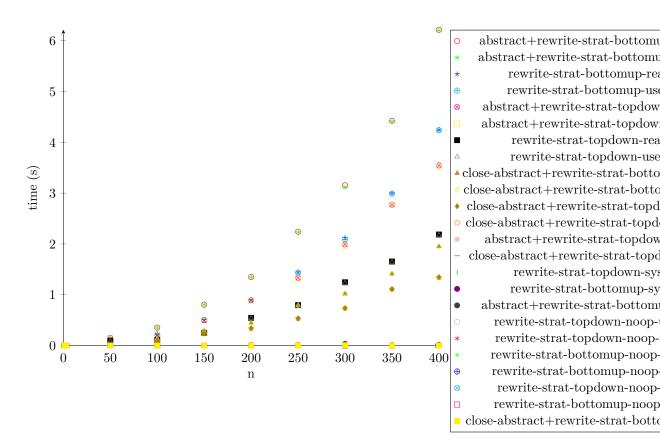


Figure 10: timing-rewrite-repeated-app-rewrite-strat

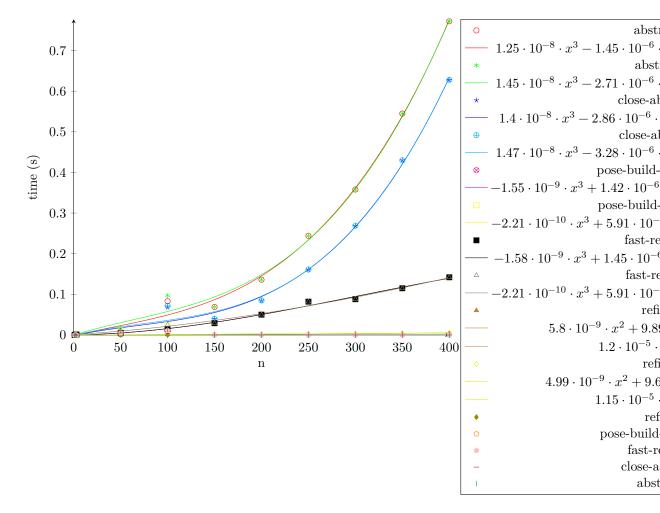
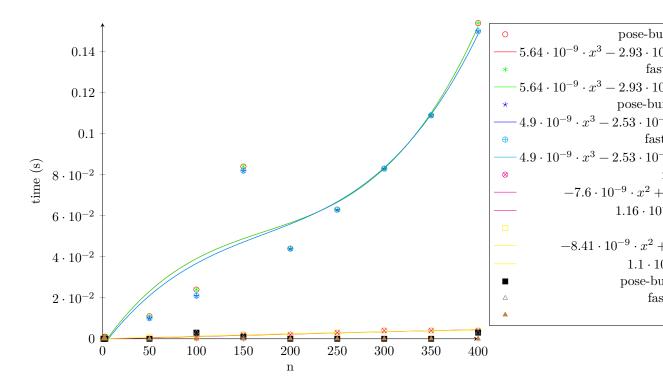
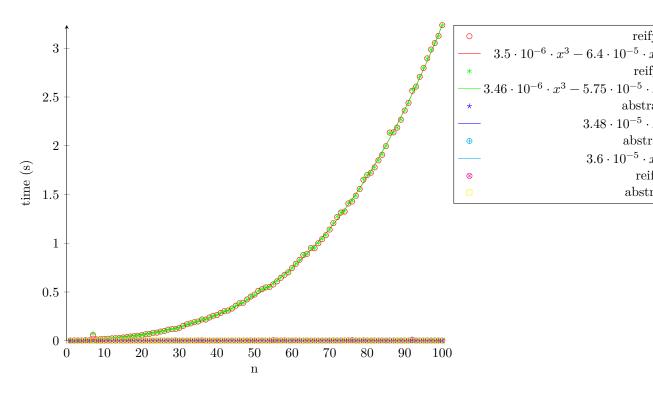


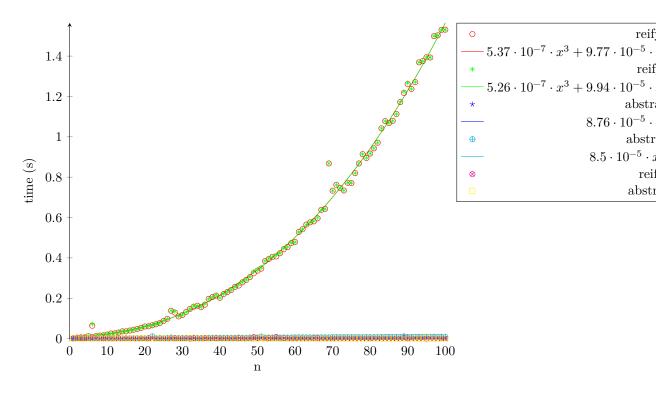
Figure 11: timing-rewrite-repeated-app-fast-rewrite



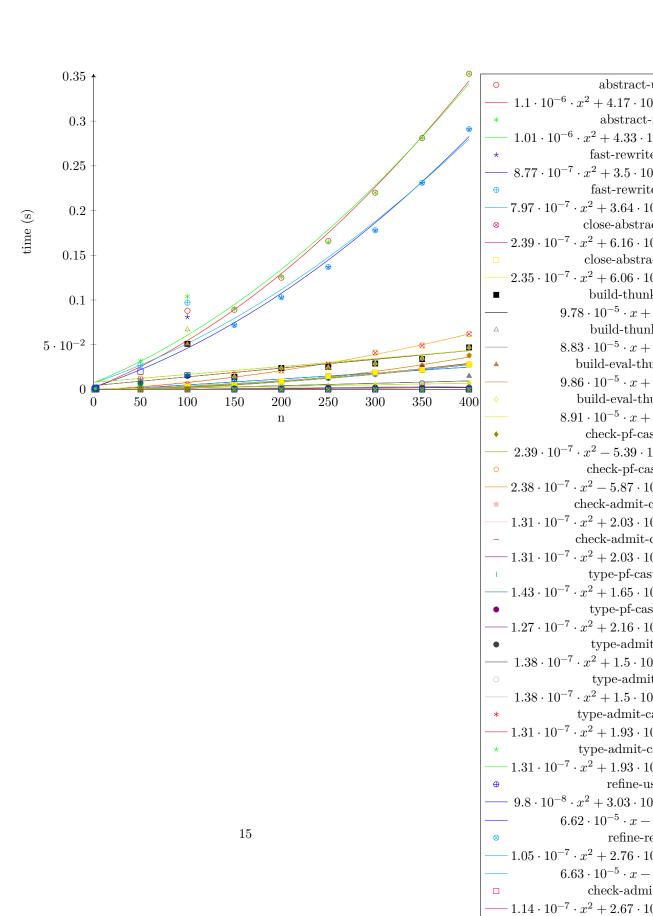
 ${\bf Figure~12:~timing\text{-}rewrite\text{-}repeated\text{-}app\text{-}fast\text{-}rewrite\text{-}no\text{-}abstract}}$ 



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



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



abstract-

abstract-

fast-rewrite

fast-rewrite

close-abstrac

close-abstra

build-thunk

 $9.78 \cdot 10^{-5} \cdot x +$ build-thunl

 $8.83 \cdot 10^{-5} \cdot x +$ build-eval-thu  $9.86 \cdot 10^{-5} \cdot x +$ 

build-eval-thu

check-pf-cas

check-pf-cas

check-admit-c

check-admit-o

type-pf-cas

type-pf-cas

type-admit

type-admit

type-admit-ca

type-admit-c

 $6.62 \cdot 10^{-5} \cdot x -$ 

 $6.63\cdot 10^{-5}\cdot x$ check-admi

 $1.12 \cdot 10^{-7} \cdot x^2 + 2.62 \cdot 10^{-7}$ 

check-admi

refine-us

refine-re

 $8.91 \cdot 10^{-5} \cdot x +$