

Figure 1: timing-pattern

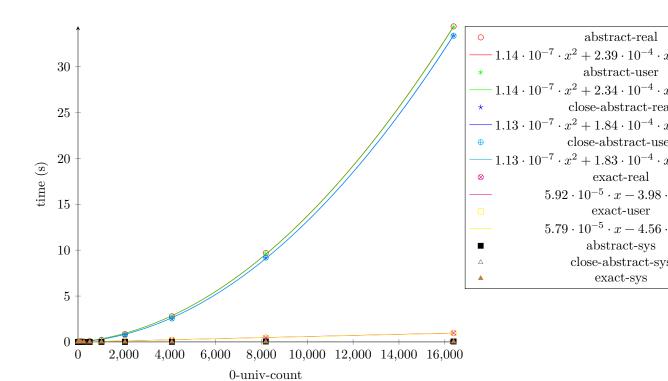


Figure 2: timing-n-polymorphic-universes param-1-n 0

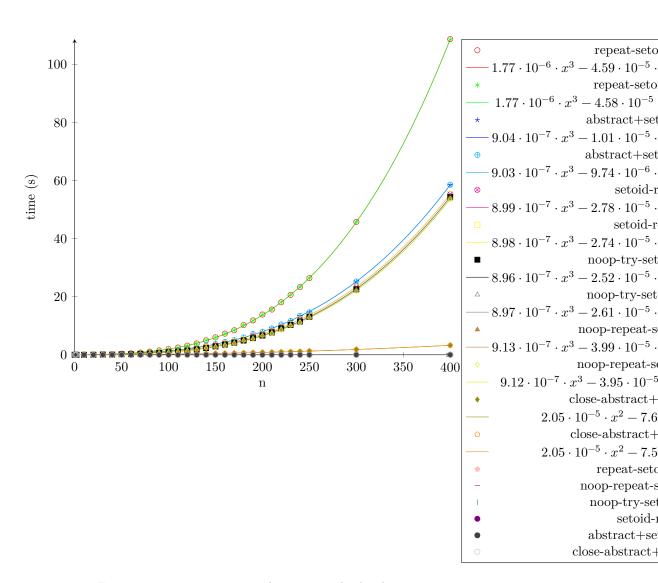
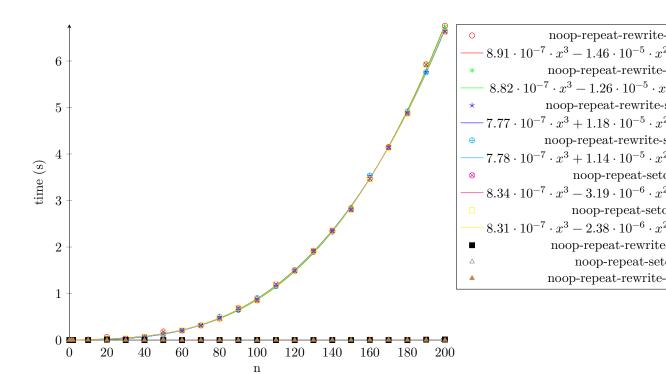


Figure 3: timing-repeat-setoid-rewrite-under-binders



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

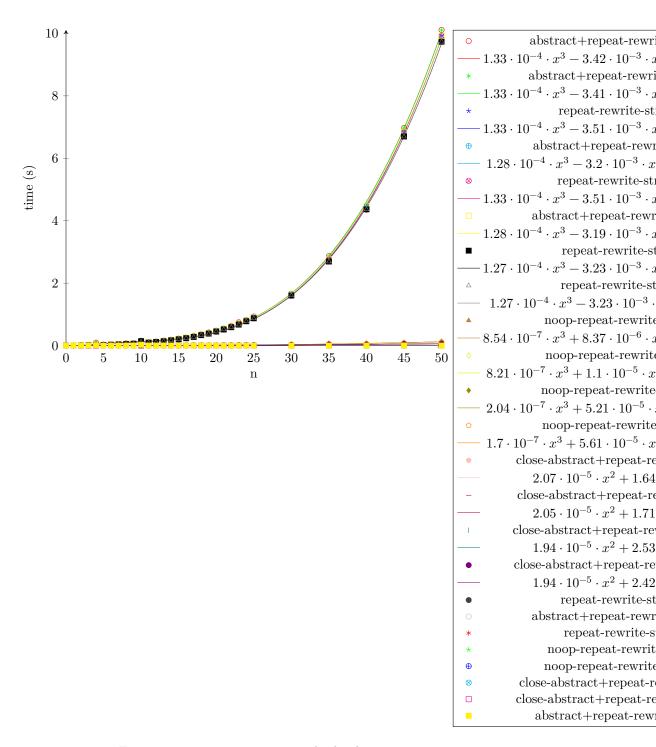


Figure 5: timing-rewrite-strat-under-binders

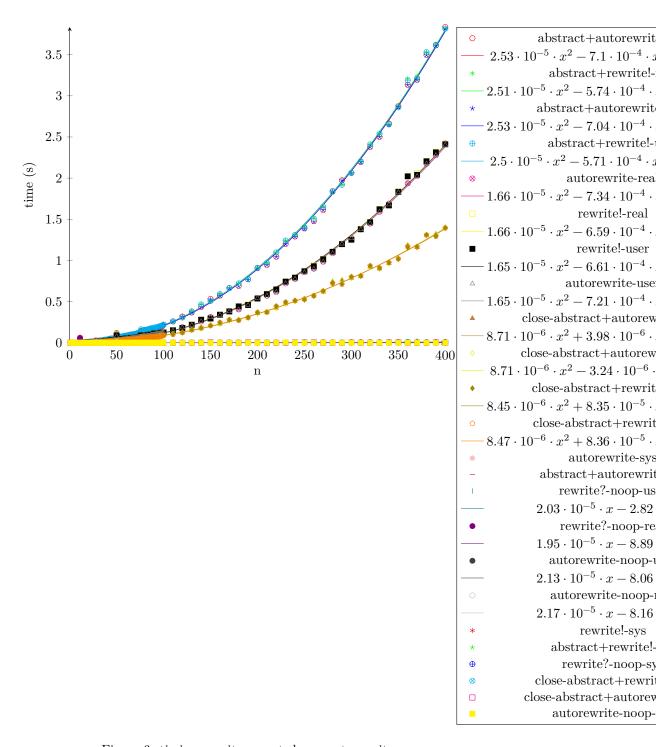


Figure 6: timing-rewrite-repeated-app-autorewrite

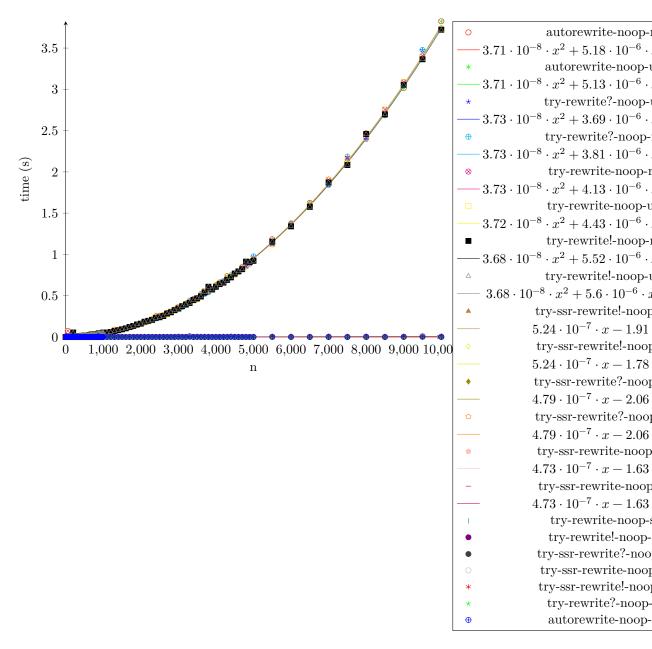


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

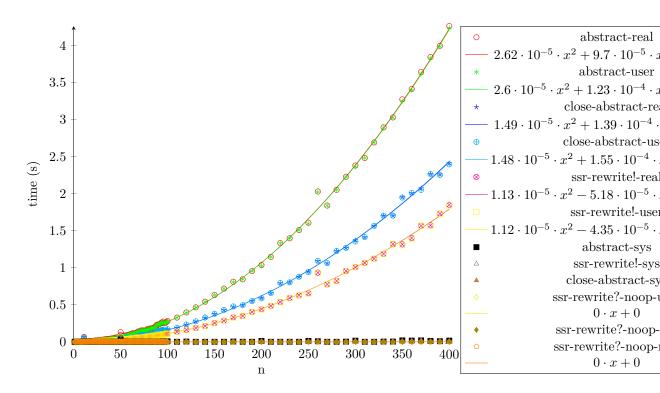


Figure 8: timing-rewrite-repeated-app-ssrrewrite

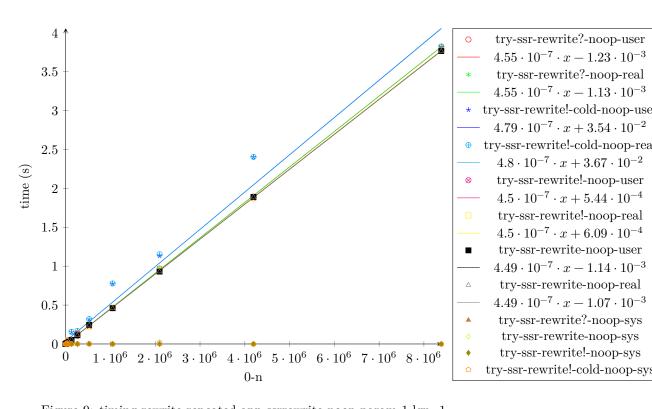


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn $\ 1$

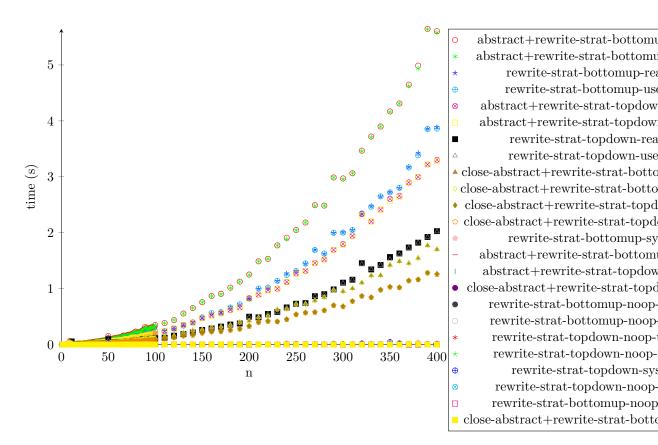


Figure 10: timing-rewrite-repeated-app-rewrite-strat

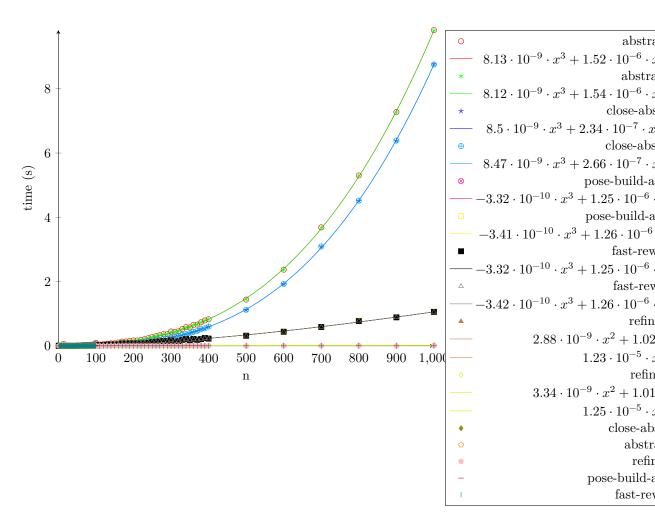
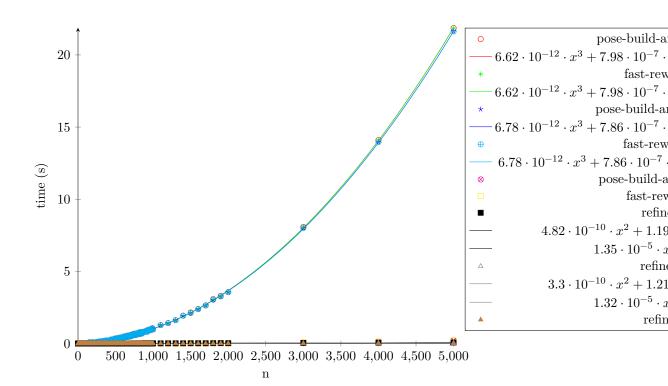


Figure 11: timing-rewrite-repeated-app-fast-rewrite



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

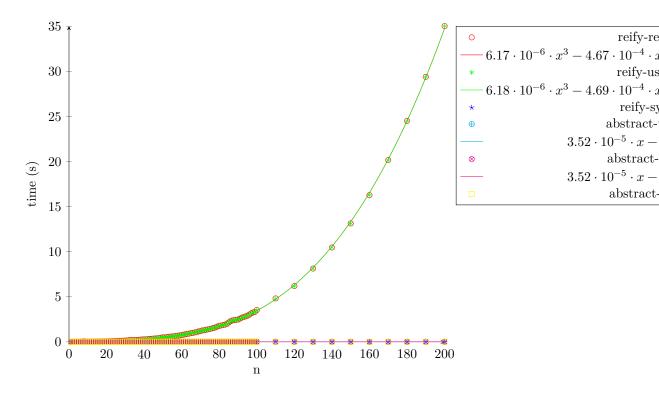


Figure 13: timing-typeclass-reification-let-in-HOAS

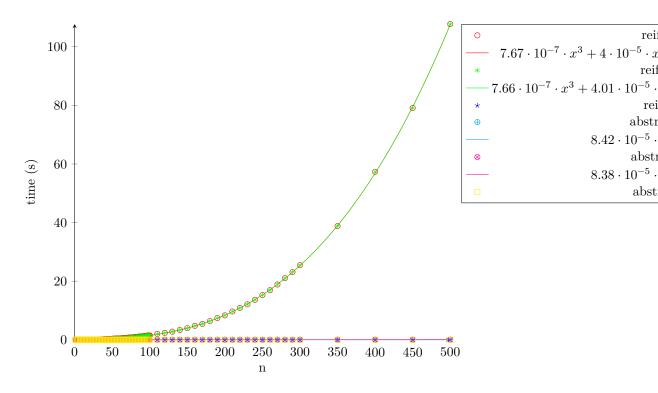
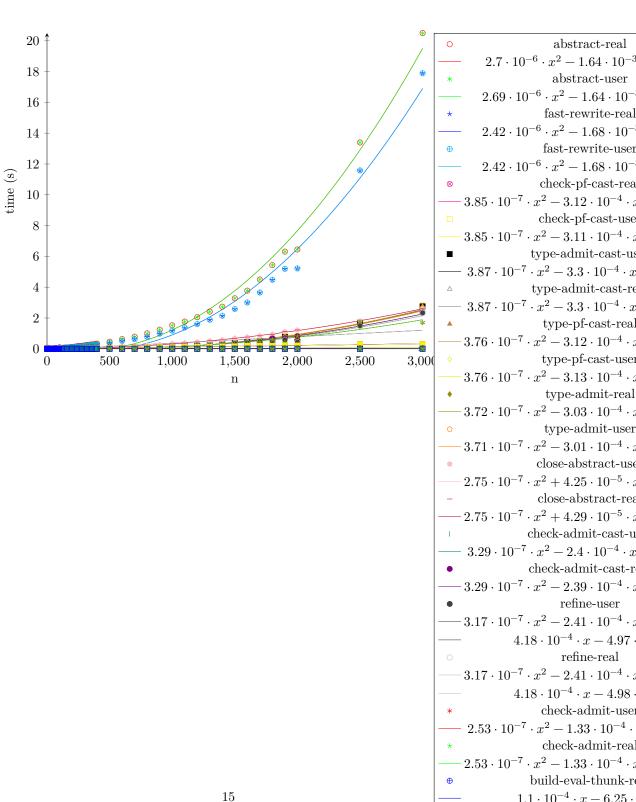


Figure 14: timing-typeclass-reification-let-in-PHOAS



abstract-real

abstract-user

fast-rewrite-real

fast-rewrite-user

check-pf-cast-rea

check-pf-cast-use

type-admit-cast-us

type-admit-cast-re

type-pf-cast-real

type-pf-cast-user

type-admit-real

type-admit-user

close-abstract-use

close-abstract-rea

check-admit-cast-u

check-admit-cast-r

 $4.18 \cdot 10^{-4} \cdot x - 4.97 \cdot$ refine-real

 $4.18 \cdot 10^{-4} \cdot x - 4.98 \cdot$ check-admit-user

check-admit-real

build-eval-thunk-re

 $1.1 \cdot 10^{-4} \cdot x - 6.25$ build-thunk-real $1.09 \cdot 10^{-4} \cdot x - 6.74 \cdot$ build-eval-thunk-u $1.09 \cdot 10^{-4} \cdot x - 8.07 \cdot$ build-thunk-user $1.08 \cdot 10^{-4} \cdot x - 8.61$ obools I man

refine-user

 $2.7 \cdot 10^{-6} \cdot x^2 - 1.64 \cdot 10^{-3}$

 $2.69 \cdot 10^{-6} \cdot x^2 - 1.64 \cdot 10^{-6}$

 $2.42 \cdot 10^{-6} \cdot x^2 - 1.68 \cdot 10^{-8}$

 $2.42 \cdot 10^{-6} \cdot x^2 - 1.68 \cdot 10^{-8}$