

Figure 1: timing-pattern

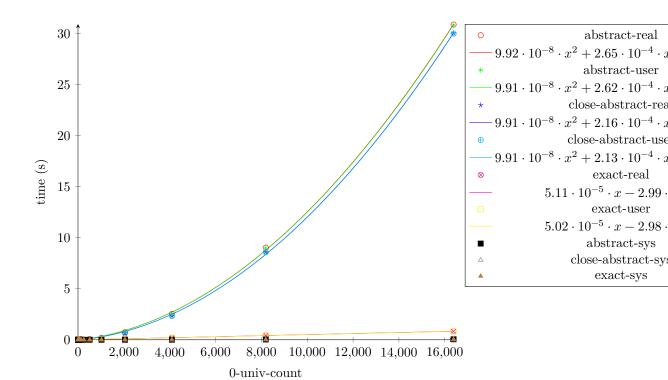


Figure 2: timing-n-polymorphic-universes param-1-n 0

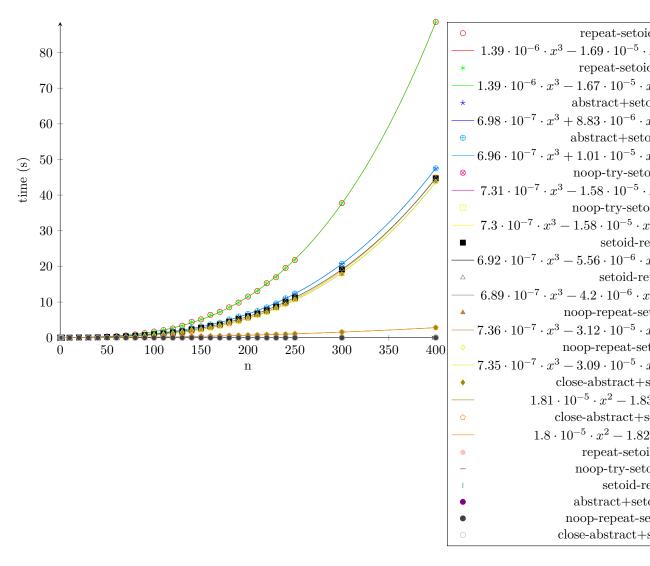


Figure 3: timing-repeat-setoid-rewrite-under-binders

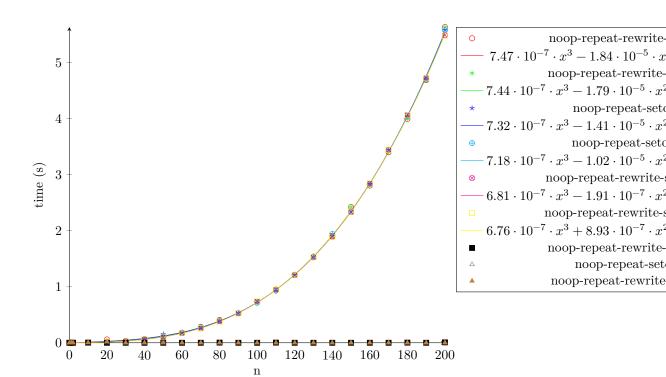


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

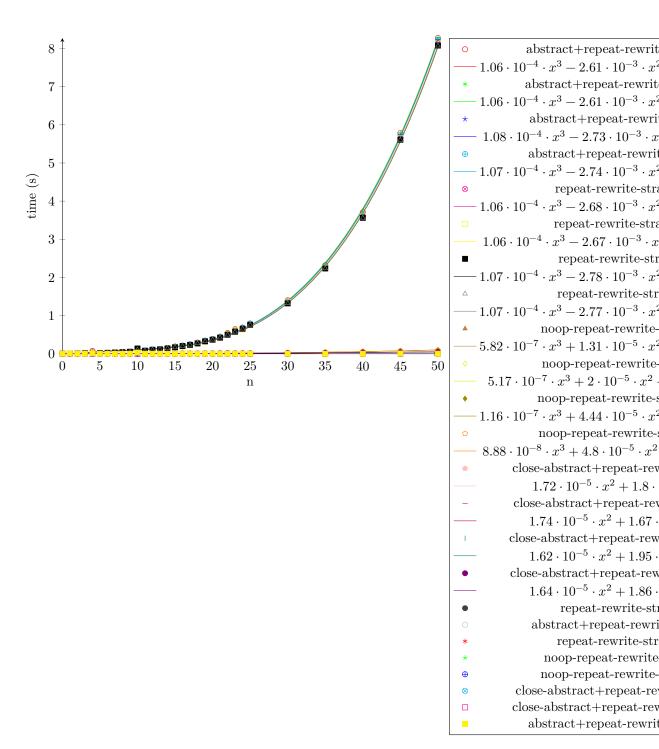


Figure 5: timing-rewrite-strat-under-binders

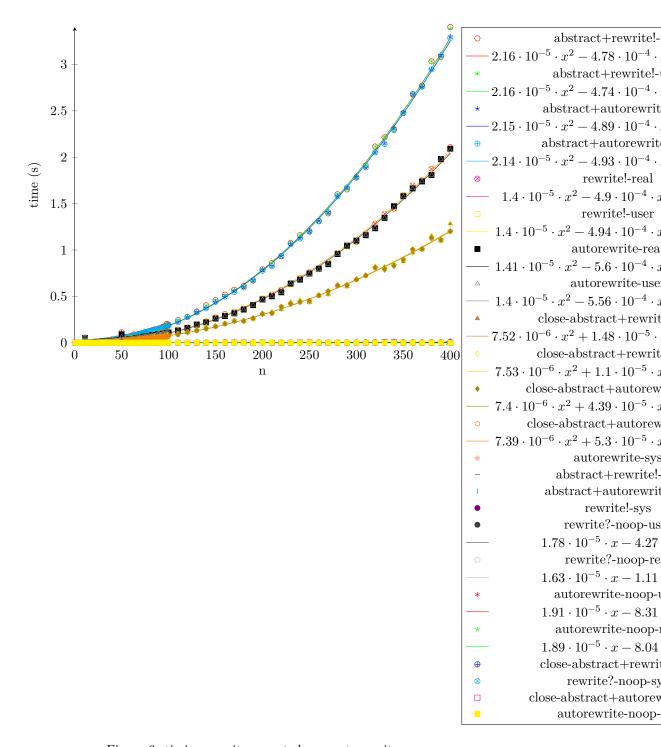


Figure 6: timing-rewrite-repeated-app-autorewrite

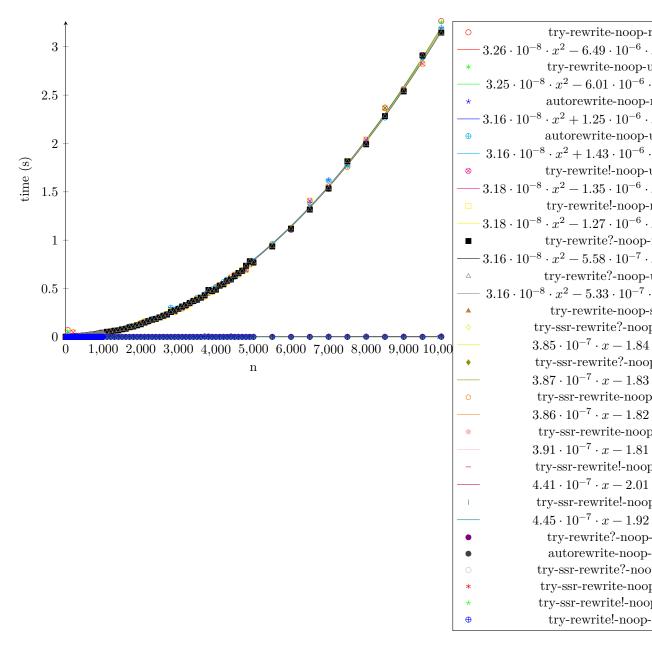


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

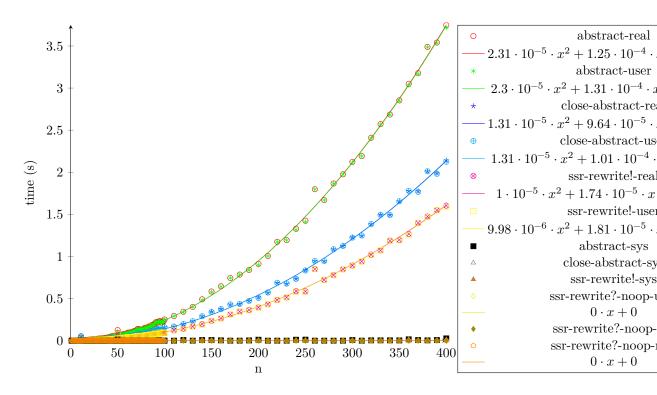


Figure 8: timing-rewrite-repeated-app-ssrrewrite

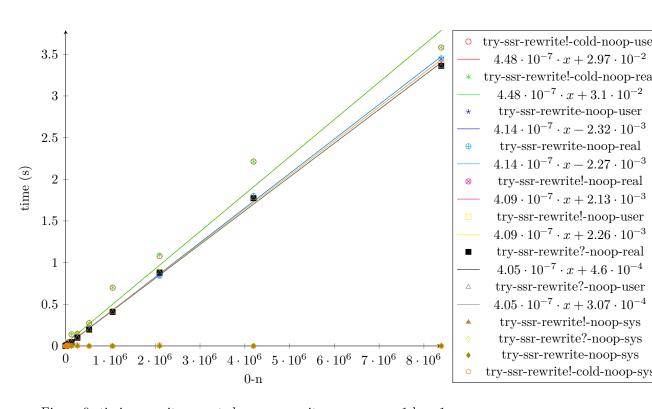


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn $\ 1$

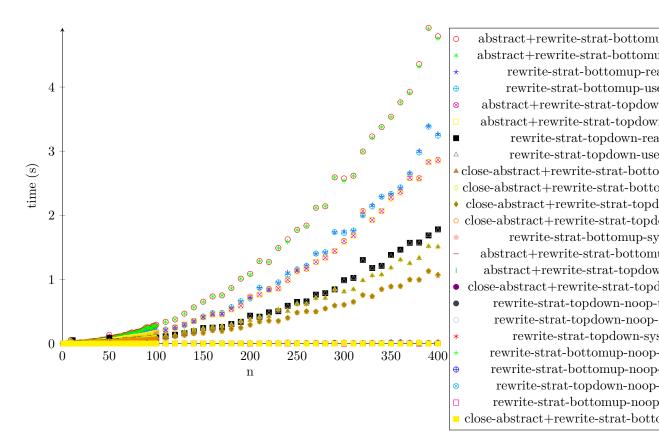
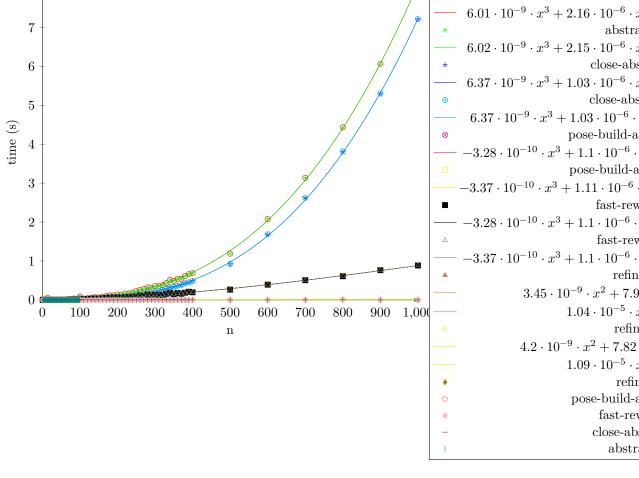


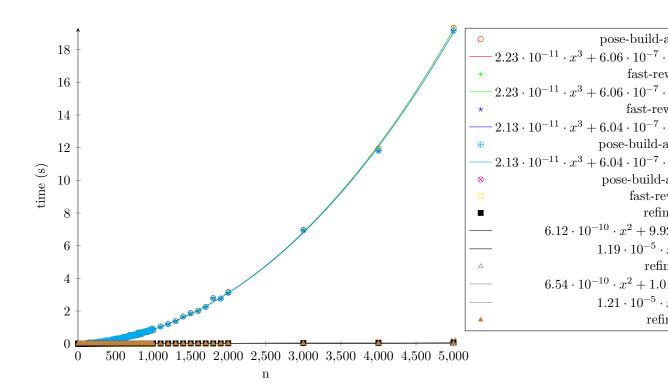
Figure 10: timing-rewrite-repeated-app-rewrite-strat



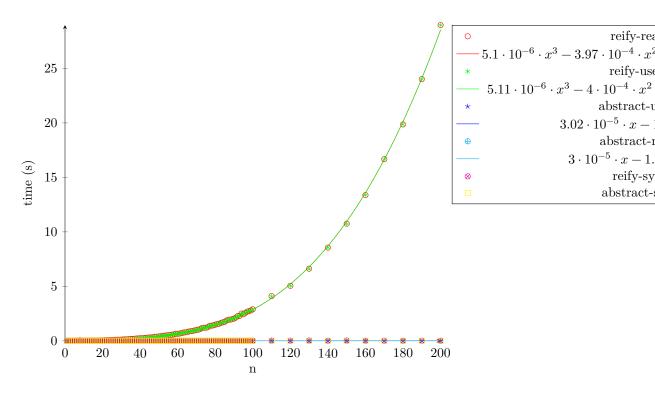
abstra

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

8 1



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



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

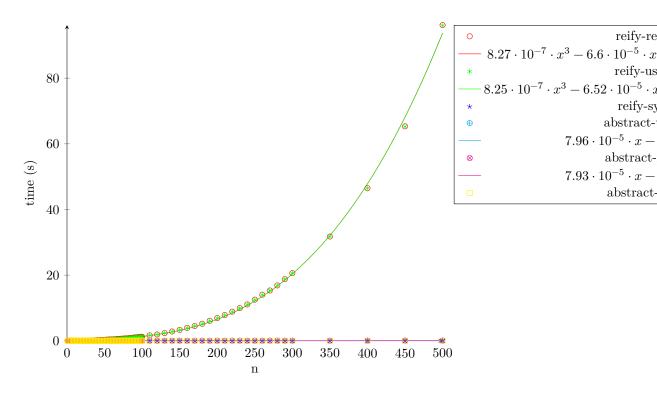
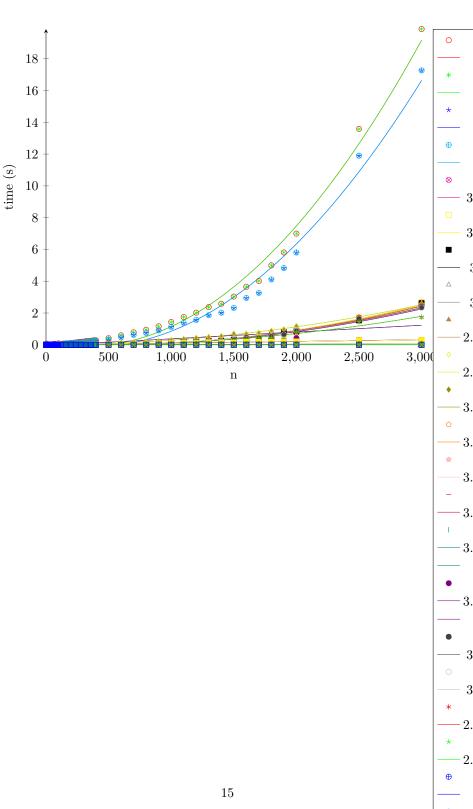


Figure 14: timing-typeclass-reification-let-in-PHOAS



 $2.68 \cdot 10^{-6} \cdot x^2 - 1.69 \cdot 10^{-6}$ $2.68 \cdot 10^{-6} \cdot x^2 - 1.7 \cdot 10^{-3}$ $2.4 \cdot 10^{-6} \cdot x^2 - 1.71 \cdot 10^{-3}$ $2.4 \cdot 10^{-6} \cdot x^2 - 1.71 \cdot 10^{-3}$ $3.86\cdot 10^{-7}\cdot x^2 - 3.24\cdot 10^{-4}\cdot$ $3.86 \cdot 10^{-7} \cdot x^2 - 3.24 \cdot 10^{-4}$ $3.7 \cdot 10^{-7} \cdot x^2 - 3.09 \cdot 10^{-4} \cdot x^2$ $3.7 \cdot 10^{-7} \cdot x^2 - 3.09 \cdot 10^{-4} \cdot x^2$ $2.76 \cdot 10^{-7} \cdot x^2 + 1.22 \cdot 10^{-5} \cdot x^2$ $2.77 \cdot 10^{-7} \cdot x^2 + 1.13 \cdot 10^{-5} \cdot x^2$ $3.76 \cdot 10^{-7} \cdot x^2 - 3.18 \cdot 10^{-4} \cdot x^2$ $3.76 \cdot 10^{-7} \cdot x^2 - 3.18 \cdot 10^{-4} \cdot x^2$ $3.44 \cdot 10^{-7} \cdot x^2 - 2.62 \cdot 10^{-4} \cdot x^2$ $3.44 \cdot 10^{-7} \cdot x^2 - 2.61 \cdot 10^{-4} \cdot x^2$ $3.42 \cdot 10^{-7} \cdot x^2 - 2.83 \cdot 10^{-4} \cdot x^2$ $3.42 \cdot 10^{-7} \cdot x^2 - 2.83 \cdot 10^{-4} \cdot x^2$ $3.36 \cdot 10^{-7} \cdot x^2 - 2.52 \cdot 10^{-4}$ $3.36\cdot 10^{-7}\cdot x^2 - 2.52\cdot 10^{-4}\cdot$ $2.44 \cdot 10^{-7} \cdot x^2 - 1.39 \cdot 10^{-4} \cdot x^2$ $2.44 \cdot 10^{-7} \cdot x^2 - 1.39 \cdot 10^{-4} \cdot x^2$

 $1.07 \cdot 10^{-4} \cdot x - 5.49 \cdot$ build-thunk-real $1.06 \cdot 10^{-4} \cdot x - 5.83 \cdot$

abstract-real

abstract-user

fast-rewrite-real

fast-rewrite-user

type-admit-cast-us

type-admit-cast-re

check-admit-cast-u

check-admit-cast-r

close-abstract-rea

close-abstract-use

type-admit-user

type-admit-real

check-pf-cast-use

check-pf-cast-rea

refine-user

 $4.28 \cdot 10^{-4} \cdot x - 5.24 \cdot$ refine-real

 $4.28 \cdot 10^{-4} \cdot x - 5.24 \cdot$ type-pf-cast-user

type-pf-cast-real

check-admit-user

check-admit-real

build-eval-thunk-u

 $1.07 \cdot 10^{-4} \cdot x - 6.8 \cdot$ build-eval-thunk-re

build-thunk-user $1.06 \cdot 10^{-4} \cdot x - 6.93$ oboole I