

Figure 1: timing-pattern

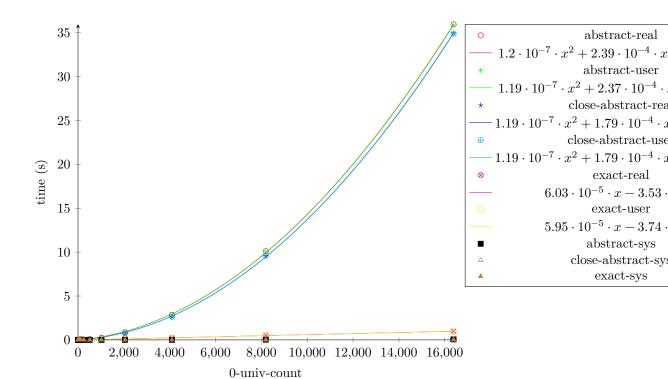


Figure 2: timing-n-polymorphic-universes param-1-n 0

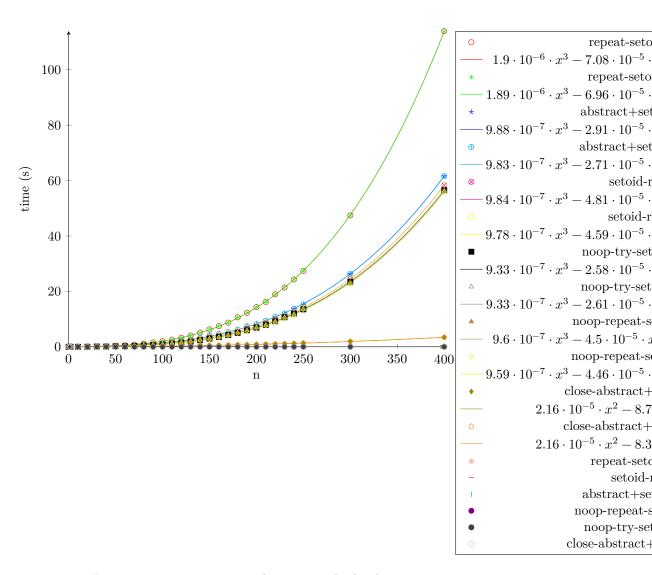


Figure 3: timing-repeat-setoid-rewrite-under-binders

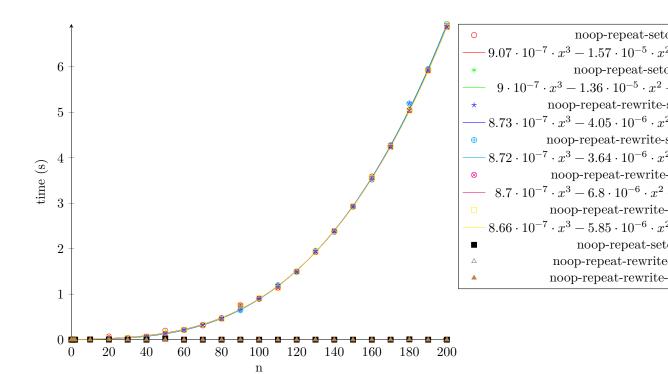


Figure 4: timing-repeat-setoid-rewrite-under-binders-noop

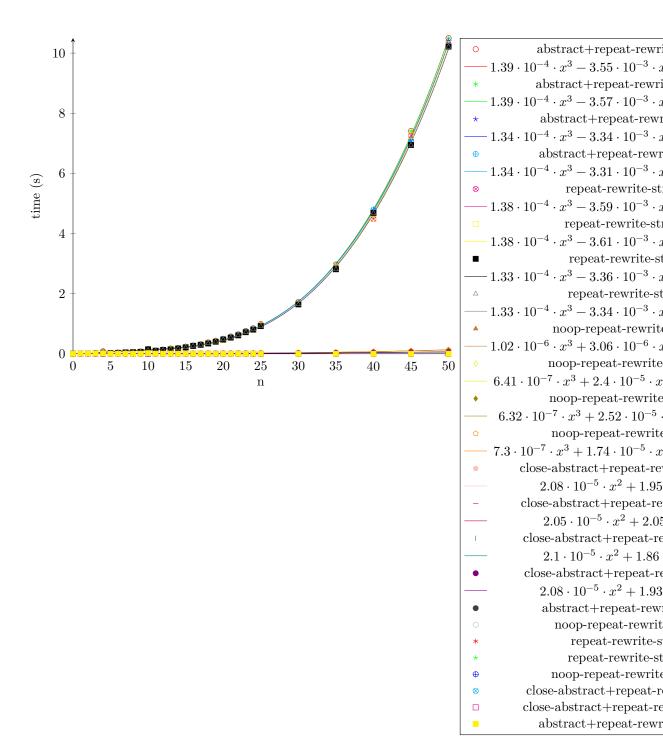


Figure 5: timing-rewrite-strat-under-binders

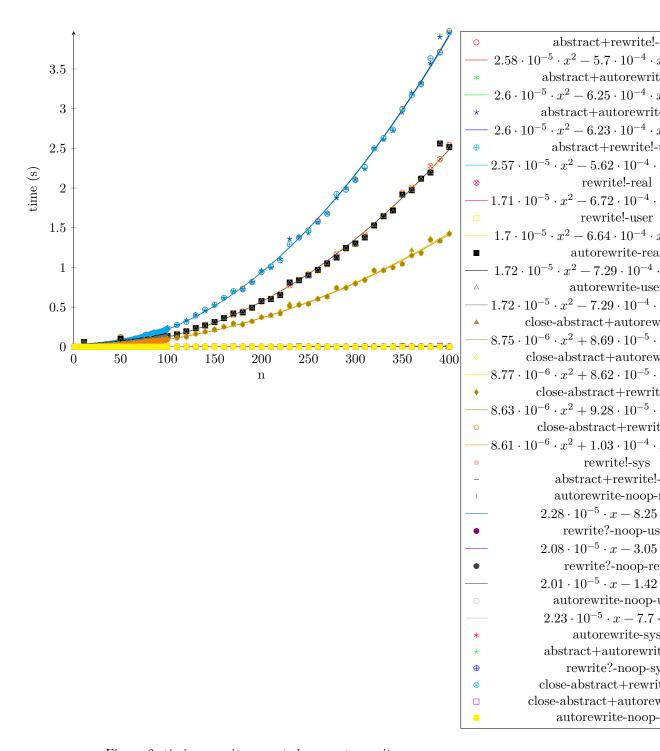


Figure 6: timing-rewrite-repeated-app-autorewrite

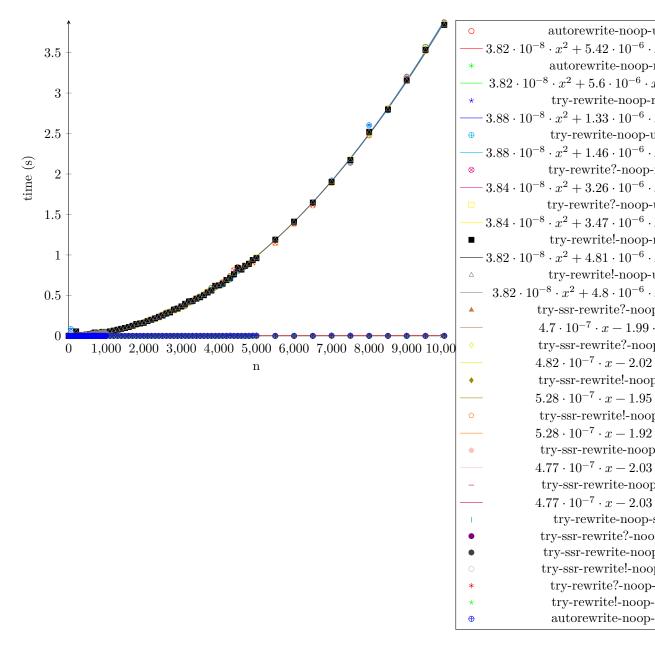


Figure 7: timing-rewrite-repeated-app-autorewrite-noop

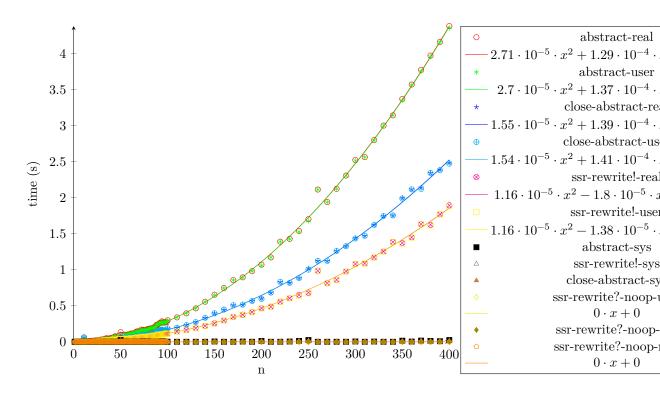


Figure 8: timing-rewrite-repeated-app-ssrrewrite

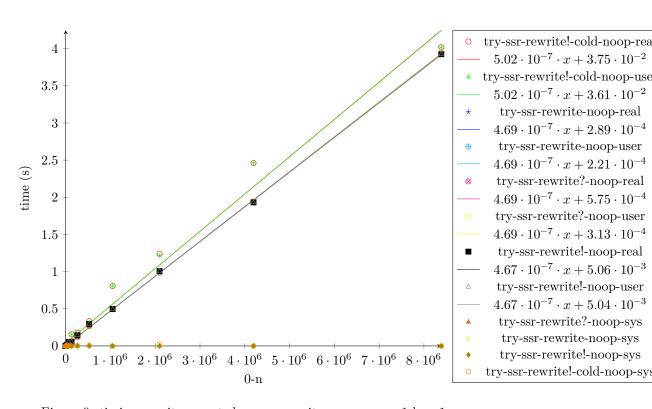


Figure 9: timing-rewrite-repeated-app-ssrrewrite-noop param-1-lgn $\ 1$

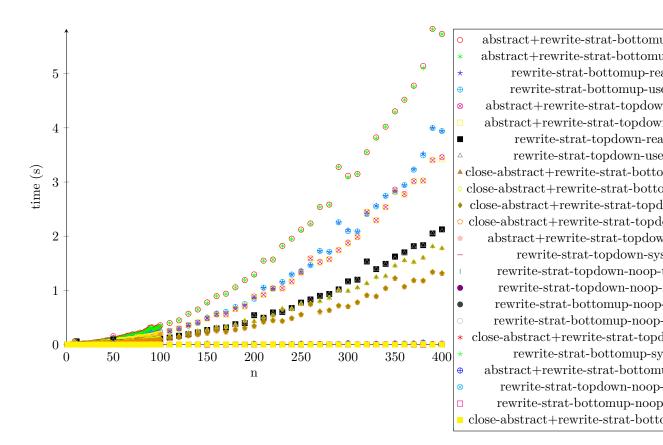


Figure 10: timing-rewrite-repeated-app-rewrite-strat

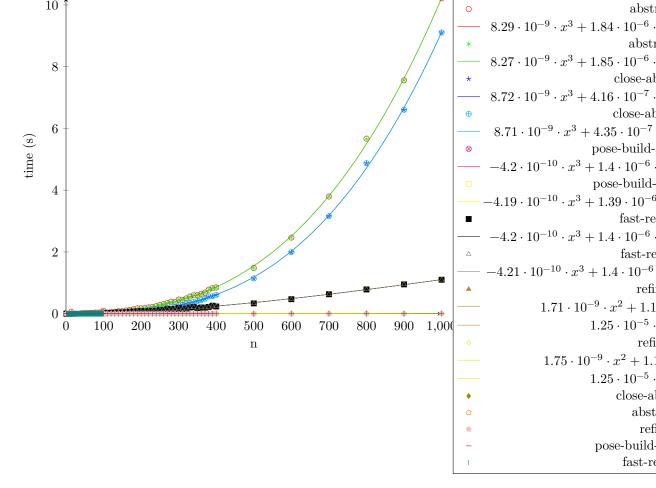
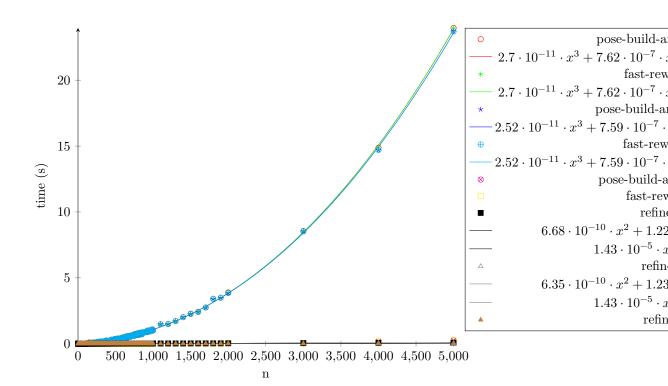
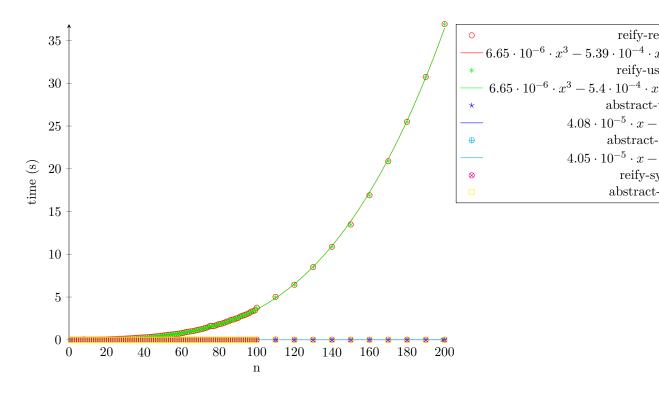


Figure 11: timing-rewrite-repeated-app-fast-rewrite

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



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

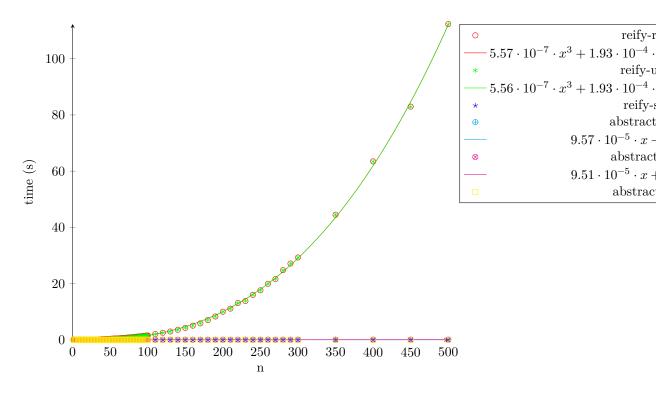
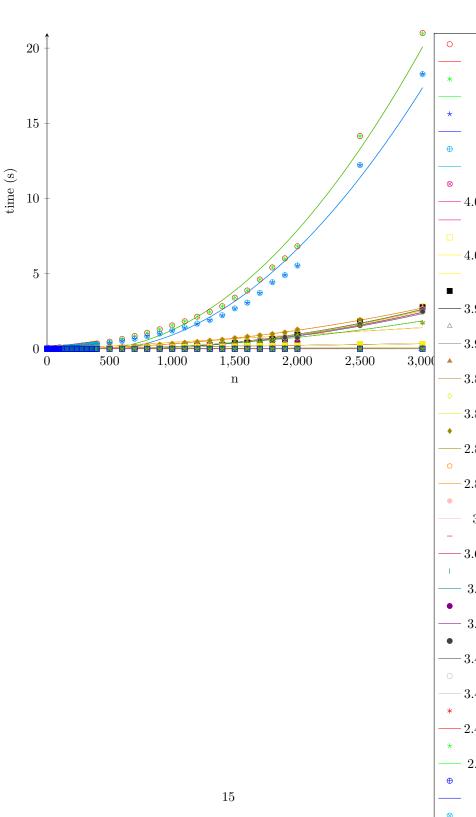


Figure 14: timing-typeclass-reification-let-in-PHOAS



 $2.78 \cdot 10^{-6} \cdot x^2 - 1.71 \cdot 10^{-6}$ $2.78 \cdot 10^{-6} \cdot x^2 - 1.7 \cdot 10^{-3}$ $2.49 \cdot 10^{-6} \cdot x^2 - 1.75 \cdot 10^{-6}$ $2.49 \cdot 10^{-6} \cdot x^2 - 1.74 \cdot 10^{-6}$ $4.02 \cdot 10^{-7} \cdot x^2 - 3.45 \cdot 10^{-4} \cdot x^2$ $4.89 \cdot 10^{-4} \cdot x - 6.03 \cdot$ $4.01 \cdot 10^{-7} \cdot x^2 - 3.44 \cdot 10^{-4} \cdot x^2$ $4.89 \cdot 10^{-4} \cdot x - 6.02 \cdot$ $3.95 \cdot 10^{-7} \cdot x^2 - 3.19 \cdot 10^{-4} \cdot x^2$ $3.95 \cdot 10^{-7} \cdot x^2 - 3.19 \cdot 10^{-4} \cdot x^2$ $3.84 \cdot 10^{-7} \cdot x^2 - 3.14 \cdot 10^{-4} \cdot x^2$ $3.83 \cdot 10^{-7} \cdot x^2 - 3.12 \cdot 10^{-4} \cdot x^2$ $2.89 \cdot 10^{-7} \cdot x^2 + 3.82 \cdot 10^{-5} \cdot x^2$ $2.89 \cdot 10^{-7} \cdot x^2 + 3.83 \cdot 10^{-5} \cdot x^2$ $3.68 \cdot 10^{-7} \cdot x^2 - 3 \cdot 10^{-4} \cdot x$ $3.67 \cdot 10^{-7} \cdot x^2 - 2.99 \cdot 10^{-4} \cdot x^2$ $3.57 \cdot 10^{-7} \cdot x^2 - 2.98 \cdot 10^{-4}$ $3.57 \cdot 10^{-7} \cdot x^2 - 2.98 \cdot 10^{-4}$ $3.47 \cdot 10^{-7} \cdot x^2 - 2.62 \cdot 10^{-4} \cdot x^2$ $3.47 \cdot 10^{-7} \cdot x^2 - 2.62 \cdot 10^{-4} \cdot x^2$ $2.41 \cdot 10^{-7} \cdot x^2 - 1.05 \cdot 10^{-4} \cdot x^2$ $2.4 \cdot 10^{-7} \cdot x^2 - 1.04 \cdot 10^{-4} \cdot x$ $1.14 \cdot 10^{-4} \cdot x - 5.53$

abstract-real

abstract-user

fast-rewrite-real

fast-rewrite-user

refine-real

refine-user

type-pf-cast-user

type-pf-cast-real

type-admit-user

type-admit-real

close-abstract-use

close-abstract-rea

check-pf-cast-rea

check-pf-cast-use

type-admit-cast-us

type-admit-cast-re

check-admit-cast-u

check-admit-cast-r

check-admit-real

check-admit-user

build-eval-thunk-ua

build-thunk-user $1.13 \cdot 10^{-4} \cdot x - 7.31 \cdot$ build-thunk-real $1.13 \cdot 10^{-4} \cdot x - 6.66$ ob ools I see

 $1.14 \cdot 10^{-4} \cdot x - 6.28$ build-eval-thunk-re