controllable-refinement

Version 7.8

Lîm Tsú-thuàn

October 23, 2020

The type system based on STLC, introducing user-controllable type refinement. Meta type variables are A, B. Meta predicate variable is P. A type with predicate write as A_P, introduce predicate write as P_+, eliminate write as P_-, $P_{?+}$ for anyway introduce, $P_{?-}$ for anyway eliminate.

- verify-predicate

$$\frac{\Gamma, f : A_P \to B, x : A_P}{f\,x : B}$$

- introduce-predicate

$$\frac{\Gamma, f : (p : A_{P_+}) \to B, x : A}{f\,x : B, x : A_P, p : A}$$

- eliminate-predicate

$$\frac{\Gamma, f : (p : A_{P_-}) \to B, x : A_P}{f\,x : B, x : A, p : A_P}$$

- anyway-introduce-predicate

$$\frac{\Gamma, f : A_{P_{?+}} \to B, x : A}{f\,x : B, x : A_P} \quad \frac{\Gamma, f : A_{P_{?+}} \to B, x : A_P}{f\,x : B, x : A_P}$$

- anyway-eliminate-predicate

$$\frac{\Gamma, f : A_{P_{?-}} \to B, x : A_P}{f\,x : B, x : A} \quad \frac{\Gamma, f : A_{P_{?-}} \to B, x : A}{f\,x : B, x : A}$$

Notice that it can be extended to with polymorphism without changing previous definition.