Manual de Hue

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Abstract

The abstract text goes here.

1 Hue

Es un asistente de pruebas basados en el Calculo de Construccions λC

2 PTS: Pure Type System

Definición 2.1. Un PTS $\mathcal{P}$ esta definido por $\{\mathcal{S}, \mathcal{V}, \mathcal{A}, \mathcal{R}\}$ donde

- $\mathcal{S}$ es un conjunto sorts
- $\mathcal{V}$ es un conjunto de variables
- $\mathcal{A}$ es un conjunto no vacio de $\mathcal{S} \times \mathcal{S}$ llamados axiomas
- $\mathcal{R}$ es un conjunto de $\mathcal{S} \times \mathcal{S} \times \mathcal{S}$ llamadas $\Pi - Reglas$

Definición 2.2. El conjunto T de pseudoterminos de un PTS $\mathcal{P} = \{\mathcal{S}, \mathcal{V}, \mathcal{A}, \mathcal{R}\}$ es el menor conjunto que satisface lo siguiente:

- $\mathcal{S} \cup \mathcal{V} \subset \mathcal{T}$
- Si $a \in \mathcal{T}$ y $b \in \mathcal{T}$ entonces $ab \in \mathcal{T}$
- Si $A \in \mathcal{T}$, $B \in \mathcal{T}$ y $x \in \mathcal{V}$ entonces $(\lambda x : A.B) \in \mathcal{T}$
- Si $A \in \mathcal{T}$, $B \in \mathcal{T}$ y $x \in \mathcal{V}$ entonces $(\Pi x : A.B) \in \mathcal{T}$

Definición 2.3. Definimos a la relacion $\vdash$, con $\vdash \subseteq \mathcal{C} \times \mathcal{T} \times \mathcal{T}$ como la menor relación que cumple:

$$(Srt) \qquad \frac{}{\emptyset \vdash s_1 : s_2} \qquad (s_1, s_2) \in \mathcal{A}$$

$$(Var) \qquad \frac{\Gamma \vdash A : s}{\Gamma, x : A \vdash x : A}$$

$$(Wk) \qquad \frac{\Gamma \vdash b : B \quad \Gamma \vdash A : s}{\Gamma, x : A \vdash b : B} \qquad b \in \mathcal{S} \cup \mathcal{V}$$

$$(Pi) \qquad \frac{\Gamma \vdash A : s_1 \quad \Gamma, x : A \vdash B : s_2}{\Gamma \vdash \Pi x : A.B : s_3} \qquad (s_1, s_2, s_3) \in \mathcal{R}$$

$$(Lda) \qquad \frac{\Gamma \vdash A : s_1 \quad \Gamma, x : A \vdash b : B \quad \Gamma, x : A \vdash B : s_2}{\Gamma \vdash \lambda a : A.b : \Pi x : A.B} \qquad (s_1, s_2, s_3) \in \mathcal{R}$$

$$(App) \qquad \frac{\Gamma \vdash a : \Pi x : B.A \quad \Gamma \vdash b : B}{\Gamma \vdash ab : A[x := b]}$$

$$(Cnv) \qquad \frac{\Gamma \vdash a : A \quad \Gamma \vdash B : s}{\Gamma \vdash a : B} \qquad A \simeq B$$

3 Teoría del calculo de λC

Definición 3.1. λC es un PTS definido por $\{\mathcal{S}, \mathcal{V}, \mathcal{A}, \mathcal{R}\}$ tales que:

- $\mathcal{S} = \{Prop, Type\}$
- $\mathcal{V} = \dots$
- $\mathcal{A} = \{(Prop, Type)\}$
- $\mathcal{R} = \{(Prop, Prop, Prop), (Type, Prop, Prop), (Type, Type, Type)\}$

Lema 3.1. λC es un PTS *full*

Proof. $\square$

3.1 Terminos

3.2 Reduccion

3.3 Contextos

3.4 Typechecker

[3] [1] [2]

$$\frac{}{\vdash s_1 : s_2}\ \text{Srtnsd} \tag{1}$$

$$\frac{\Gamma \vdash A :\twoheadrightarrow s}{\Gamma, x : A \vdash_{nsd} x : A}\ \text{Varnsd} \tag{2}$$

$$\frac{\Gamma \vdash_{nsd} b : B \quad \Gamma \vdash A :\twoheadrightarrow s}{\Gamma, x : A \vdash_{nsd} b : B}\ \text{Wknsd} \tag{3}$$

$$\frac{\Gamma \vdash A :\twoheadrightarrow s_1 \quad \Gamma, x : A \vdash_{nsd} B :\twoheadrightarrow s_2}{\Gamma \vdash_{nsd} \Pi x : A.B : s_3}\ \text{Pinsd} \tag{4}$$

$$\frac{\Gamma \vdash A :\twoheadrightarrow s_1 \quad \Gamma, x : A \vdash_{nsd} b :\twoheadrightarrow B \quad \Gamma, x : A \vdash_{nsd} B :\twoheadrightarrow s_2}{\Gamma \vdash_{nsd} \lambda x : A.b : \Pi x : A.B}\ \text{Ldansd} \tag{5}$$

$$\frac{\Gamma \vdash a :\twoheadrightarrow \Pi x : A.B \quad \Gamma \vdash_{nsd} b :\twoheadrightarrow B}{\Gamma \vdash_{nsd} a\ b : A[x := b]}\ \text{Appnsd} \tag{6}$$

4 Conclusion

Write your conclusion here.

References

[1] L. S. van Benthem Jutting, J. McKinna, and R. Pollack. Checking algorithms for pure type systems. In H. Barendregt and T. Nipkow, editors, *Types for Proofs and Programs*, pages 19–61. Springer, Berlin, Heidelberg, 1993.

[2] L. S. van Benthem Jutting, James McKinna, and Robert Pollack. Checking algorithms for pure type systems. In Henk Barendregt and Tobias Nipkow, editors, *Types for Proofs and Programs, International Workshop TYPES'93, Nijmegen, The Netherlands, May 24-28, 1993, Selected Papers*, volume 806 of *Lecture Notes in Computer Science*, pages 19–61. Springer, 1993.

[3] L.S. van Benthem Jutting, J. McKinna, and R. Pollack. Checking algorithms for pure type systems, 1993.