Modern Type Theory

An introduction to modern dependent type theory

BSc. Ridan Vandenbergh

KU Leuven

1980-01-01

6. Standard types **1**
6.1. Dependent product type 2

6.1. Dependent product type

Π-types

The **dependent function type**, also known as *dependent products* or **Π-types**, contain functions whose codomain type may vary based on the terms of its domain.

Π-types are formed as follows:

$$\frac{\Gamma \vdash A \text{ type} \qquad \Gamma.A \vdash B \text{ type}}{\Gamma \vdash \Pi(A, B) \text{ type}}$$

6.1. Dependent product type

$$\frac{\Gamma \vdash A \ \mathsf{type} \qquad \Gamma.A \vdash b : B}{\Gamma \vdash \lambda(b) : \Pi(A, B)}$$

$$\frac{\Gamma \vdash a : A \qquad \Gamma.A \vdash B \ \mathsf{type} \qquad \Gamma \vdash f : \Pi(A, B)}{\Gamma \vdash f\ a : B[\mathrm{id}\,.a]}$$