

# Kempe Type System

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September 6, 2021

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## 0.1 Introduction

This presents the Kempe type system.

## 0.2 Syntax

$$\begin{array}{lcl} \langle kind \rangle & ::= & \langle type \rangle \\ & | & \langle kind \rangle \langle kind \rangle \end{array}$$

$$\begin{array}{lcl} \langle type \rangle & ::= & \langle int \rangle \\ & | & \langle word \rangle \\ & | & \langle bool \rangle \end{array}$$

## 0.3 Judgments

$$\frac{\Gamma \vdash x : \alpha_1 \cdots \alpha_n - \beta_1 \cdots \beta_m \gamma_1 \cdots \gamma_k \quad \Gamma \vdash y : \gamma_1 \cdots \gamma_k - \delta_1 \cdots \delta_l}{\Gamma \vdash xy : \alpha_1 \cdots \alpha_n - \beta_1 \cdots \beta_m \delta_1 \cdots \delta_l} \quad (\text{CONCAT})$$

$$\frac{\Gamma \vdash x : \alpha_1 \cdots \alpha_n - \beta_1 \cdots \beta_m}{\Gamma \vdash x : a\alpha_1 \cdots \alpha_n - a\beta_1 \cdots \beta_m} \quad (\text{GENERALIZE})$$

$$\frac{\Gamma \vdash x : \alpha_1 \cdots \alpha_n - \beta_1 \cdots \beta_m}{\Gamma \vdash [x] : - - [\alpha_1 \cdots \alpha_n - \beta_1 \cdots \beta_m]} \quad (\text{QUOTE})$$

$$\frac{\Gamma \vdash f : - - [\alpha_1 \cdots \alpha_n - \beta_1 \cdots \beta_m]}{\Gamma \vdash \text{apply } f : \alpha_1 \cdots \alpha_n - \beta_1 \cdots \beta_m} \quad (\text{APPLY})$$