KTH ROYAL INSTITUTE
OF TECHNOLOGY

Degree Project in Technology

First cycle, 15 credits

This is the title in the language of the thesis

A subtitle in the language of the thesis

FAKE A. STUDENT
FAKE B. STUDENT

Stockholm, Sweden, 2024

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A subtitle in the language of the thesis

FAKE A. STUDENT

FAKE B. STUDENT

Bachelor's Programme in Information and Communication Technology
Date: January 23, 2024

Supervisors: A. Busy Supervisor, Another Busy Supervisor, Third Busy Supervisor
Examiner: Gerald Q. Maguire Jr.
School of Electrical Engineering and Computer Science
Host company: Företaget AB
Swedish title: Detta är den svenska översättningen av titeln
Swedish subtitle: Detta är den svenska översättningen av undertiteln

0.1 Inference Rules

$$\text{T-TASK}\ \frac{x : C; ocap \vdash t : \tau \quad \Gamma; a \vdash b : Q \rhd Box[C]}{\Gamma; a \vdash task(b)\{x \Rightarrow t\} : Q \rhd Task[C]}$$

$$\text{T-ASYNC}\ \frac{Perm[Q] \in \Gamma \quad \Gamma \setminus Perm[Q]; a \vdash s : \sigma \quad \Gamma; a \vdash x : Q \rhd Task[C]}{\Gamma; a \vdash async(x)\{s\} : \bot}$$

$$\text{T-FINISH}\ \frac{\Gamma; a \vdash t : \tau}{\Gamma; a \vdash finish\{t\} : null}$$

$$\text{E-TASK}\ \frac{L(b') = b(o,p)}{\begin{array}{l} H, \{(f, \langle L, \quad let\ x = task(b')\{x \Rightarrow t\} in\ s, P\rangle^l)\} \uplus TS \\ \rightsquigarrow\ H, \{(f, \langle L[x \to task(b(o,p),t)], s, \quad P\rangle^l)\} \uplus TS \end{array}}$$

$$\text{E-ASYNC}\ \frac{\begin{array}{c} L(y) = task(b(o,p),t) \\ T_1 = (f, \langle L,\ s,\ P\rangle^\epsilon) \\ T_2 = (f, \langle [x \to o],\ t,\ \emptyset\rangle^\epsilon) \end{array}}{\begin{array}{l} H, \{(f, \langle L,\ async(y)\{s\},\ \{p\} \uplus P\rangle^l \circ FS)\} \uplus TS \\ \rightsquigarrow\ H, \{T_1, T_2\} \quad \uplus TS \end{array}}$$

$$\text{E-FINISH1}\ \frac{\begin{array}{c} T = (f', \langle L,\ t,\ P\rangle^\epsilon) \\ f' fresh \end{array}}{\begin{array}{l} H, \{(f, \langle L,\ let\ x = finish\{\ t\ \}\ in\ s,\ P\rangle^l \circ FS)\} \quad \uplus TS \\ \rightsquigarrow\ H, \{(f, \langle FINISH\, f'\rangle \circ \langle L[x \to null],\ s,\ P\rangle^l \circ FS)\} \uplus \{T\} \uplus TS \end{array}}$$

$$\text{E-FINISH2}\ \frac{\nexists (f', FS) \in TS}{\begin{array}{l} H, \{(f, \langle FINISH\, f'\rangle \circ FS)\} \uplus TS \\ \rightsquigarrow\ H, \{(f, FS)\} \quad \uplus TS \end{array}}$$

$$\text{E-TASK-DONE}\ \frac{}{H, \epsilon \uplus TS \rightsquigarrow TS}$$