



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

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Bachelor's Programme in Information and Communication Technology

Date: January 22, 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

$$\begin{array}{c}
\text{T-TASK} \frac{x : C; \text{ocap} \vdash t : \tau \quad \Gamma; a \vdash b : Q \triangleright \text{Box}[C]}{\Gamma; a \vdash \text{task}(b)\{x \Rightarrow t\} : Q \triangleright \text{Task}[C]} \\
\text{T-ASYNC} \frac{\text{Perm}[Q] \in \Gamma \quad \Gamma \setminus \text{Perm}[Q]; a \vdash s : \sigma \quad \Gamma; a \vdash t : Q \triangleright \text{Task}[C]}{\Gamma; a \vdash \text{async}(t)\{s\} : \perp} \\
\text{T-FINISH} \frac{\Gamma; a \vdash t : \tau}{\Gamma; a \vdash \text{finish}\{t\} : \text{null}} \\
\text{E-TASK} \frac{L(b') = b(o, p) \quad H, \langle L, \quad \quad \quad \text{let } x = \text{task}(b')\{x \Rightarrow t\} \text{ in } s, P \rangle^l}{\rightarrow H, \langle L[x \rightarrow \text{task}(b(o, p), t)], s, \quad \quad \quad P \rangle^l} \\
\text{E-ASYNC} \frac{T_1 = (f, \langle L, s, P \rangle^\epsilon) \quad L(y) = \text{task}(b(o, p), t) \quad T_2 = (f, \langle [x \rightarrow o], t, \emptyset \rangle^\epsilon)}{H, (f, \langle L, \text{async}(y)\{s\}, p \uplus P \rangle^l \circ FS) \uplus TS \quad \rightsquigarrow H, \{T_1, T_2\} \quad \uplus TS} \\
\text{E-FINISH1} \frac{T = (f', \langle L, t, P \rangle^\epsilon) \quad f' \text{ fresh}}{H, \{(f, \langle L, \text{let } x = \text{finish}\{t\} \text{ in } s, P \rangle^l \circ FS)\} \quad \uplus TS \quad \rightsquigarrow H, \{(f, \langle \text{FINISH } f' \rangle \circ \langle L[x \rightarrow \text{null}], s, P \rangle^l \circ FS)\} \uplus \{T\} \uplus TS} \\
\text{E-FINISH2} \frac{\nexists (f', FS) \in TS}{H, \{(f, \langle \text{FINISH } f' \rangle \circ FS)\} \uplus TS \quad \rightsquigarrow H, \{(f, FS)\} \quad \uplus TS}
\end{array}$$