



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 12, 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; 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, \text{let } x = \text{task}(b')\{x \Rightarrow t\} \text{ in } s, P \rangle^l \circ FS\} \uplus TS}{\longrightarrow H, \{\langle L[x \rightarrow \text{task}(b(o, p), t)], s, P \rangle^l \circ FS\} \uplus TS} \\
\text{E-ASYNC} \frac{\nexists \langle \text{FINISH}(_, f) \rangle \in FS \quad f' \text{ fresh} \quad L(y) = \text{task}(b(o, p), t) \quad T = \langle [x \rightarrow o], t, \emptyset \rangle^\epsilon \circ \langle \text{FINISH}(f, f') \rangle}{H, \{\langle L, \text{async}(y)\{s\}.p \uplus P \rangle^l \circ FS \circ \langle \text{FINISH}(_, f) \rangle \circ FS'\} \uplus TS \longrightarrow H, \{\langle L, s, P \rangle^l \circ \langle \text{FINISH}(_, f) \rangle \circ FS', T \} \uplus TS} \\
\text{E-FINISH1} \frac{FS = FS_1 \circ \langle \text{FINISH}(_, f) \rangle \circ FS_2 \quad \nexists \langle \text{FINISH}(_, f) \rangle \in FS_1 \quad F_1 = \langle L, t, P \rangle^\epsilon \quad F_2 = \langle \text{FINISH}(f, f') \rangle \quad f' \text{ fresh} \quad F_3 = \langle L[x \rightarrow \text{null}], s, P \rangle^l}{H, \{\langle L, \text{let } x = \text{finish}\{t\} \text{ in } s, P \rangle^l \circ FS\} \uplus TS \longrightarrow H, \{F_1 \circ F_2 \circ F_3 \circ FS\} \uplus TS} \\
\text{E-FINISH2} \frac{\nexists T \in TS. T = FS' \circ \langle \text{FINISH}(f, _) \rangle \circ FS''}{H, \{\langle \text{FINISH}(_, f) \rangle \circ FS\} \uplus TS \longrightarrow H, \{FS\} \uplus TS}
\end{array}$$