並行分散計算特論 (9)

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Verification by Observation Equivalence

System $\approx$ Specification

System: new $\vec{a}.(P_1|\cdots|P_n)$

Specification: in Seq Proc. Exp.

Example:Lottery

Specifiction

$Lotspec \stackrel{def}{=} \tau.b_1.Lotspec + \cdots + \tau.b_n.Lotspec$

N agents to rotate a token to be selected

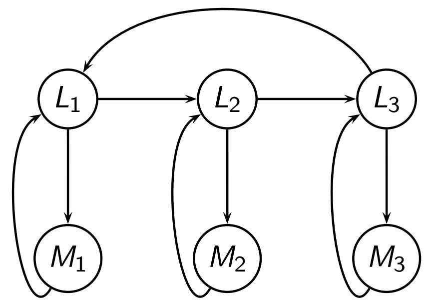
$$A(a,b,c) \stackrel{def}{=} \overline{a}.C(a,b,c)$$
$$B(a,b,c) \stackrel{def}{=} b.C$$
$$C(a,b,c) \stackrel{def}{=} \tau.B(a,b,c) + c.A(a,b,c)$$

new $\vec{a}(C_1|A_2|\cdots|A_n)$

Example:Lottery

if n=3

$$L_1 = \text{new } a_1a_2a_3(C_1|A_2|A_3)$$
$$L_2 = \text{new } a_1a_2a_3(A_1|C_2|A_3)$$
$$L_3 = \text{new } a_1a_2a_3(A_1|A_2|C_3)$$



Verification of Lottery

Theorem

$L_1 \approx \text{Lotspec}$

Proof sketch: Show the following $\mathcal{S}$ is a weak bisimulation:
$\mathcal{S} = \{(L_i, \text{Lotspec}) | 1 \leq i \leq n\} \cup \{(L'_i, b_i.\text{Lotspec})\}$