

Errata

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Location: Section 4.4, Definition 5(ii), Page 25

Description: There is an error in Definition 5(ii) that causes unintended consequences of the axiomatisation of C^2KA .

Correction:

Definition 5 (Communicating Concurrent Kleene Algebra). A Communicating Concurrent Kleene Algebra (C^2KA) is a system $(\mathcal{S}, \mathcal{K})$, where $\mathcal{S} = (S, \oplus, \odot, \mathfrak{d}, \mathfrak{n})$ is a stimulus structure and $\mathcal{K} = (K, +, *, ;, \textcircled{*}, \textcircled{\odot}, 0, 1)$ is a CKA such that $(\textcircled{S}K, +)$ is a unitary and zero-preserving left \mathcal{S} -semimodule with mapping $\circ : S \times K \rightarrow K$ and $(S_{\mathcal{K}}, \oplus)$ is a unitary and zero-preserving right \mathcal{K} -semimodule with mapping $\lambda : S \times K \rightarrow S$, and where the following axioms are satisfied for all $a, b, c \in K$ and $s, t \in S$:

$$(i) \quad s \circ (a ; b) = (s \circ a) ; (\lambda(s, a) \circ b)$$

$$(ii) \quad a \leq_{\mathcal{K}} c \vee b = 1 \vee (s \circ a) ; (\lambda(s, c) \circ b) = 0$$

$$(iii) \quad \lambda(s \odot t, a) = \lambda(s, (t \circ a)) \odot \lambda(t, a)$$

In Definition 5, Axiom (ii), which is referred to as the *cascading output law*, states that when an external stimulus is introduced to the sequential composition $(a ; b)$, then either the cascaded stimulus must be generated by the behaviour a , or the behaviour b must be the idle agent behaviour 1. It allows distributivity of \circ over $;$ to be applied indiscriminately and ensures consistency between the next behaviour and next stimulus mappings with respect to the sequential composition of agent behaviours.