Errata

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Title: Endowing Concurrent Kleene Algebra with Communication Actions
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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 $\mathcal{C}^2\mathcal{K}A$.

Correction:

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

\begin{align*}
(i) & \quad s \circ (a \cdot b) = (s \circ a) \cdot (\lambda(s,a) \circ b) \\
(ii) & \quad a \preceq_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)) \circ \lambda(t,a)
\end{align*}

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 $\cdot$ to be applied indiscriminately and ensures consistency between the next behaviour and next stimulus mappings with respect to the sequential composition of agent behaviours.