

event-system0^{0,22}

ES0

\equiv_{def} $E:\text{Type}$
 $\times \text{EqDecider}(E)$
 $\times T:(\text{Id} \rightarrow \text{Id} \rightarrow \text{Type})$
 $\times V:(\text{Id} \rightarrow \text{Id} \rightarrow \text{Type})$
 $\times M:(\text{IdLnk} \rightarrow \text{Id} \rightarrow \text{Type})$
 $\times \text{Top}$
 $\times \text{loc}:(E \rightarrow \text{Id})$
 $\times \text{kind}:(E \rightarrow \text{Knd})$
 $\times \text{val}:(e:E \rightarrow \text{eventtype}(\text{kind}; \text{loc}; V; M; e))$
 $\times \text{when}:(x:\text{Id} \rightarrow e:E \rightarrow T(\text{loc}(e), x))$
 $\times \text{after}:(x:\text{Id} \rightarrow e:E \rightarrow T(\text{loc}(e), x))$
 $\times \text{sends}:(l:\text{IdLnk} \rightarrow E \rightarrow (\text{Msg_sub}(l; M) \text{ List}))$
 $\times \text{sender}:(\{e:E \mid \text{isrcv}(\text{kind}(e))\} \rightarrow E)$
 $\times \text{index}:(e:\{e:E \mid \text{isrcv}(\text{kind}(e))\} \rightarrow \mathbb{N}_{<\|\text{sends}(\text{lnk}(\text{kind}(e)), \text{sender}(e))\|})$
 $\times \text{first}:(E \rightarrow \mathbb{B})$
 $\times \text{pred}:(\{e':E \mid \neg \text{first}(e')\} \rightarrow E)$
 $\times \text{causl}:(E \rightarrow E \rightarrow \text{Prop})$
 $\times \text{ESAxioms}(E; T; M;$
 $\quad \text{loc}; \text{kind}; \text{val};$
 $\quad \text{when}; \text{after};$
 $\quad \text{sends}; \text{sender}; \text{index};$
 $\quad \text{first}; \text{pred};$
 $\quad \text{causl})$
 $\times \text{ESAtomAxiom}\{i:l\}(T; \lambda i, k. \text{kindcase}(k; a.V(i, a); l, t.M(l, t)))$
 $\times \text{Top}$

clarification:

event-system0{i:l}

\equiv_{def} $E:\text{Type}_i$
 $\times \text{EqDecider}(E)$
 $\times T:(\text{Id} \rightarrow \text{Id} \rightarrow \text{Type}_i)$
 $\times V:(\text{Id} \rightarrow \text{Id} \rightarrow \text{Type}_i)$
 $\times M:(\text{IdLnk} \rightarrow \text{Id} \rightarrow \text{Type}_i)$
 $\times \text{Top}$
 $\times \text{loc}:(E \rightarrow \text{Id})$
 $\times \text{kind}:(E \rightarrow \text{Knd})$
 $\times \text{val}:(e:E \rightarrow \text{eventtype}(\text{kind}; \text{loc}; V; M; e))$
 $\times \text{when}:(x:\text{Id} \rightarrow e:E \rightarrow T(\text{loc}(e), x))$
 $\times \text{after}:(x:\text{Id} \rightarrow e:E \rightarrow T(\text{loc}(e), x))$
 $\times \text{sends}:(l:\text{IdLnk} \rightarrow E \rightarrow (\text{Msg_sub}(l; M) \text{ List}))$

$\times \text{sender} : (\{e : E \mid \text{isrcv}(\text{kind}(e))\} \rightarrow E)$
 $\times \text{index} : (e : \{e : E \mid \text{isrcv}(\text{kind}(e))\} \rightarrow \{0.. \|\text{sends}(\text{lnk}(\text{kind}(e)), \text{sender}(e))\| - \})$
 $\times \text{first} : (E \rightarrow \mathbb{B})$
 $\times \text{pred} : (\{e' : E \mid \neg \text{first}(e')\} \rightarrow E)$
 $\times \text{causl} : (E \rightarrow E \rightarrow \text{Prop}_i)$
 $\times \text{ESAxioms}\{i:l\}$

- $(E;$
- $T;$
- $M;$
- $loc;$
- $kind;$
- $val;$
- $when;$
- $after;$
- $sends;$
- $sender;$
- $index;$
- $first;$
- $pred;$
- $causl)$

 $\times \text{ESAtomAxiom}\{i:l\}$

- $(T; (\lambda i, k. \text{kindcase}(k; a.V(i, a); l.t.M(l, t))))$

 $\times \text{Top}$