Appendix

Textual Notation Syntax Definition

This appendix defines the syntax of the textual notation used in this thesis to represent behaviour. The definition is expressed in Backus-Naur Form.

A.1 Behaviour definition

\[
\text{behaviour-definition} = \text{behaviour-identifier} "::=" \text{definition-block}. \\
\text{definition-block} = "/" [\text{synchronization-requirements-list}] \text{causality-relation} \\
\quad \{"," \text{causality-relation} \} \text{[local-definitions]} "/". \\
\text{local-definitions} = "where" \text{behaviour-definition} \{\text{behaviour-definition}\}. \\
\]

A.2 Synchronization requirements

\[
\text{synchronization-requirements-list} = \\
\quad "(\" \text{synchronization-requirement} \{\";\" \text{synchronization-requirement} \}\")". \\
\text{synchronization-requirement} = \\
\quad \text{behaviour-identifier} "," \text{behaviour-identifier} \{\";\" \text{behaviour-identifier} \},:" \\
\quad \text{action-identifier} | \text{interaction-identifier} \{\";\" \text{action-identifier} | \text{interaction-identifier} \}. \\
\]

A.3 Causality relation

\[
\text{causality-relation} = \text{condition} "\rightarrow" \text{result}. \\
\text{condition} = \text{simple-condition} | \text{composite-condition}. \\
\text{simple-condition} = \\
\quad \text{start} | \text{entry-point} | \text{occurrence-condition} | \text{non-occurrence-condition} | \text{behaviour-exit}. \\
\text{start} = "\text{start}" \{\text{attributes-list} \{\text{constraints-list}\}\}. \\
\text{entry-point} = \text{entry-identifier} \{\text{attributes-list} \{\text{constraints-list}\}\}. \\
\text{occurrence-condition} = \text{enabling-action} | \text{enabling-interaction-contribution}. \\
\text{non-occurrence-condition} = \\
\quad (\"\neg\" \text{disabling-action}) | (\"\neg\" \text{disabling-interaction-contribution}). \\
\text{behaviour-exit} = \text{behaviour-identifier} \{"\text{exit-point}\ \{\";\" \text{exit-point}\ \}\"\}. \\
\]
result = result-action | result-interaction-contribution | exit-point | behaviour-entry.
exit-point = exit-identifier [attributes-list [constraints-list]].

composite-condition =
    (simple-condition ("∧" | "∨") (simple-condition | composite-condition )) |
    "(" simple-condition ("∧" | "∨") (simple-condition | composite-condition ) ")").

A.4 Action and interaction

enabling-action = action.
disabling-action = action.
result-action = action.
action = action-identifier [attributes-list [constraints-list]].
enabling-interaction-contribution = interaction-contribution.
disabling-interaction-contribution = interaction-contribution.
result-interaction-contribution = interaction-contribution.
interaction-contribution = interaction-identifier [attributes-list [constraints-list]].

A.5 Attributes

attributes-list = 
    "(" location-time-information-list | ("[" functionality-attribute) |
    (location-time-information-list "]" functionality-attribute "))
location-time-information-list =
    (location-attribute [," time-information-list]) | time-information-list.
time-information-list = (time-attribute [," information-attribute]) | information-attribute.
location-attribute = location-value-identifier ":" "Location".
time-attribute = time-value-identifier ":" "Time".
information-attribute = information-element [," information-element].
information-element = information-element-value-identifier ":".
    information-type-identifier.
functionality-attribute = extended-location-time-information-list.
extended-location-time-information-list =
    (extended-location-attribute [," extended-time-information-list]) |
    extended-time-information-list.

extended-time-information-list =
    (extended-time-attribute [," information-attribute]) | information-attribute.
extended-location-attribute = location-attribute [," location-attribute].
extended-time-attribute = time-attribute [," time-attribute].

A.6 Constraints

constraints-list = 
    "[" constraint [," constraint] "]".
constraint = simple-constraint | composite-constraint.
simple-constraint =
  (attribute-value-identifier "=" term-expression) |
  (term-expression operation-identifier term-expression).

term-expression = simple-term | composite-term.
simple-term = attribute-value-identifier | attribute-value.

composite-term =
  (simple-term operation-identifier (simple-term | composite-term)) |
  "(" (simple-term operation-identifier (simple-term | composite-term)) ")".

composite-constraint =
  (simple-constraint ("∧" | "∨") (simple-constraint | composite-constraint )) |
  "(" (simple-constraint ("∧" | "∨") (simple-constraint | composite-constraint )) ")".

A.7 Identifiers

behaviour-identifier = identifier.
entry-identifier = "entry" {digit}.
exit-identifier = "exit" {digit}.
action-identifier = identifier.
interaction-contribution-identifier = underlined-identifier.
attribute-value-identifier =
  location-value-identifier | time-value-identifier | information-element-value-identifier.
location-value-identifier = identifier.
time-value-identifier = identifier.
information-element-value-identifier = identifier.
information-type-identifier = identifier.
attribute-value = identifier.
operation-identifier = identifier | special-character.
identifier = letter [{normal-character}].
underlined-identifier = underlined-letter [{underlined-normal-character}].

A.8 Characters

digit = "0" | "1" | ... | "9".
underlined-digit = "0" | "1" | ... | "9".
letter = "a" | "b" | ... | "z" | "A" | "B" | ... | "Z".
underlined-letter = "a" | "b" | ... | "z" | "A" | "B" | ... | "Z".
normal-character = letter | digit.
underlined-normal-character = underlined-letter | underlined-digit.
special-character = "+" | "-" | "×" | "/" | "=" | ">" | "<" | "≤" | "≥".