Appendix 10

Glossary of terms

This appendix contains a glossary of the terms used in the body of the thesis.

Glossary of terms

action a guarded command in the adm

action store (A) dynamic store for actions currently in use when executing a definitive program in the adm

action window the window used to show the contents of the action store

activity-oriented simulation a simulation in which the behaviour of the system is described primarily in terms of how the agents in the system can act

adm the abstract definitive machine, a synchronous model of computation for definitive programming consisting of program store P, action store A and definition store D

agent a component of an LSD specification which describes what one element of the system being modelled can perceive and how it can act

am the implemented abstract definitive machine

authentic value the value of a variable as perceived by the owning agent, i.e. its "genuine" value

avoidance error an error issued when a true guard requires evaluation of a non-evaluable variable

avoidance window the window used to show avoidance error messages

change of status when a variable in the run set is redefined and deleted from D

circular definition a definition which returns @ when undefined because the variable either directly or indirectly defined in terms of itself

command a redefinition of a variable or an instantiation or deletion of a variable

command list a list of commands

definition the association of a formula with a variable, where the formula is used as a recipe for future evaluation of the variable

definition store (D) dynamic store for definitions currently in use when executing a definitive program in the adm

definition window the window used to show the contents of the definition store

definitive notation a language with which to describe the states and transitions of a system which uses definitive states and redefinitions to effect transitions

definitive program a program in which redefinitions cause transitions between definitive states

definitive state state described by the use of definitions

delete keyword used in the adm in a command to delete an entity, involving removal of the owned variables from D and actions from A, or used in LSD to delete an agent instance

derivate variable a variable in an LSD agent whose value is defined by a formula in terms of other variables

dynamic actions a dynamic instantiation or deletion of an entity when executing a definitive program in the adm

entity a description of a set of actions and definitive variables in a definitive program for the adm

error used to describe a situation in which there is either an inconsistent state or an inconsistent transition is about to occur

evaluation the result of application of the evaluation operator to a variable in a definitive state. The returned value can be a constant in the underlying algebra or @ (undefined)

event-oriented simulation a simulation in which the behaviour of the system is described primarily in terms of the actions performed

execution cycle a sequence performed when executing a definitive program in the adm, consisting of guard evaluation, required variable evaluation, and command execution, together with the issuance of error messages where appropriate

fatal error an error issued when execution cannot continue because the commands in the run set lead to an inconsistent transition

global derivate a derivate whose definition uses a variable which does not appear in the variable declaration section of the agent

guard an expression which enables an associated command list

input window the window used for the entry of input

instantiation an extant parametrised copy of an entity in the adm whose variables are in D and actions in A, or an extant parametrised copy of an agent in an LSD specification which is operating autonomously

invalid transition a transition in which interference can occur if the commands are executed in parallel

LIVE variable variable used in an LSD agent which causes deletion of the agent when it becomes false

local derivate a derivate whose definition uses only variables which appear in the variable declaration section of the agent

LSD Language for Specification and Description, a language for specifying and describing a communicating system of processes acting concurrently

model a representation of a system which can be used to replicate its behaviour

modes of execution different ways in which an adm program can be executed

notifiable error an error issued when a variable in D cannot be evaluated

notifiable window the window used to show notifiable error messages

oracle variable a variable whose value is known to an LSD agent, but subject to change entirely beyond its control

owned variable used in the adm to indicate a variable which can only be used when the owning entity is instantiated, used in LSD to indicate a variables which only has meaning when the owning agent is extant

parameters used to either disambiguate between entity or agent instances or to pass information

perceived value the value of a variable as perceived by an agent, which may or may not be the same as the authentic value of the variable

procedural action action performed whilst executing a definitive program in the adm which causes output

program a description of transitions between states, with the transitions being performed automatically

program store (P) static store for entity descriptions in the adm

program window the window used to show the contents of the program store

protocol the description in an LSD agent of the capabilities of the agent

reactive system a system whose behaviour cannot be completely characterised in terms of the relation between input and output

redefinition the association of a new formula with a variable, with the effect that the previously associated formula is lost

run set the store for the set of command lists selected for execution during an execution cycle of the adm

simulation the use of a model to replicate the behaviour of a modelled system

singular state a state in which a variable in D cannot be evaluated

state variable a variable whose value is both known to and conditionally under the control of an LSD agent

status window the window used to show the output from procedural actions, execution cycle indicators, and fatal errors

superuser a user of the adm who is distinguished from an ordinary user by being able to interact with the adm whilst a program is executing

synchronisation by assumption synchronisation between agents in LSD by means of assumptions about the environment and relative operating speeds

synchronisation by perception synchronisation between agents in LSD by the percieved value of a variable being closely synchronised with its authentic value

undefined the return value from evaluation when a variable cannot be evaluated