

Extending XMSF with a Parameterized Action Representation for Agent Behaviors



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Balance Requirements



- Bandwidth
- Synchronization
- Autonomy
- Control
- Latency
- Visualization
- Interfaces

Advanced Techniques



- Networking hardware and software
- Graphics
- Artificial intelligence
- Autonomous agents

Parameterized Action Representation



- Intermediary between natural language and animation.
- Based on research in:
 - Computer graphics and animation
 - Natural language processing
 - Human movement observation science

Action Representation



type parameterized action =

(name:	STRING;
participants:	agent-and-objects;
applicability conditions:	BOOLEAN-expression;
preparatory specification:	<i>sequence</i> conditions-and-actions;
termination conditions:	BOOLEAN-expression;
post assertion:	STATEMENT;
during conditions:	STATEMENT;
purpose:	purpose-specification;
subactions:	par-constraint-graph;
parent action:	parameterized action;

...

Action Representation

type parameterized action = ...

previous action:	parameterized action;
concurrent action:	parameterized action;
next action:	parameterized action;
start:	time-specification;
duration:	time-specification;
priority:	INTEGER;
data:	ANY-TYPE;
kinematics:	kinematics-specification;
dynamics:	dynamics-specification;
manner:	manner-specification;
adverbs:	<i>sequence</i> adverb-specification
failure:	failure-data).

Object Representation



type object representation =

(name:	STRING;
is agent:	BOOLEAN;
properties:	sequence property-specification;
status:	status-specification;
posture:	posture-specification;
location:	object representation;
contents:	<i>sequence</i> object representation;
capabilities:	<i>sequence</i> parameterized action;
relative directions	<i>sequence</i> relative-direction-specification;
special directions:	<i>sequence</i> special-direction-specification;
sites:	<i>sequence</i> site-type-specification;
bounding volume	bounding-volume-specification;
coordinate system	site;
position:	vector;
velocity:	vector;
acceleration:	vector;
orientation:	vector;
data:	ANY-TYPE).

The End