DVar : set of all discrete variables names.

CVar : set of all continuous variables names.

DMtd : set of all discrete method declarations.

CMtd : set of all continuous method declarations.

Each discrete method is defined as the tuple .

Each continuous method is defined as the tuple . Where m is the name of message, i is the invariant of ODE, e is the ODE for continuous behavior, g is the guard condition for transition and a is the action for transition.

**Statements**

is ordinary differential equation for continuous behavior.

**Auxiliary functions**

inv: in which inv(x,m) returns the invariant of continuous method of m of the actor x.

guard: in which guard(x,m) returns the guard of continuous method of m of the actor x.

ode: in which ode(x,m) returns the ordinary differential equations of continuous method of m of the actor x.

action: in which action(x,m) returns the transition method of continuous method of m of the actor x.

**Operational Semantics**

The global state is a function where DS is the discrete state and is defined as and HS is the continuous state and is defined as

**Transitions**

For simplicity discrete variables are omitted.

(continuous message take)

(action expansion)

In other rules is changed to .

**Hybrid Translation**

From ) and CVar To

**Simplifications and assumptions**

No parameter for continuous methods.

No continuous variable assignment in continuous and discrete methods.

Only One message send in action.

Only one guard and invariant in continuous methods.