GLIF

Thu Feb 17 11:30:05 PST 2000

Package *EventsAndExceptions*

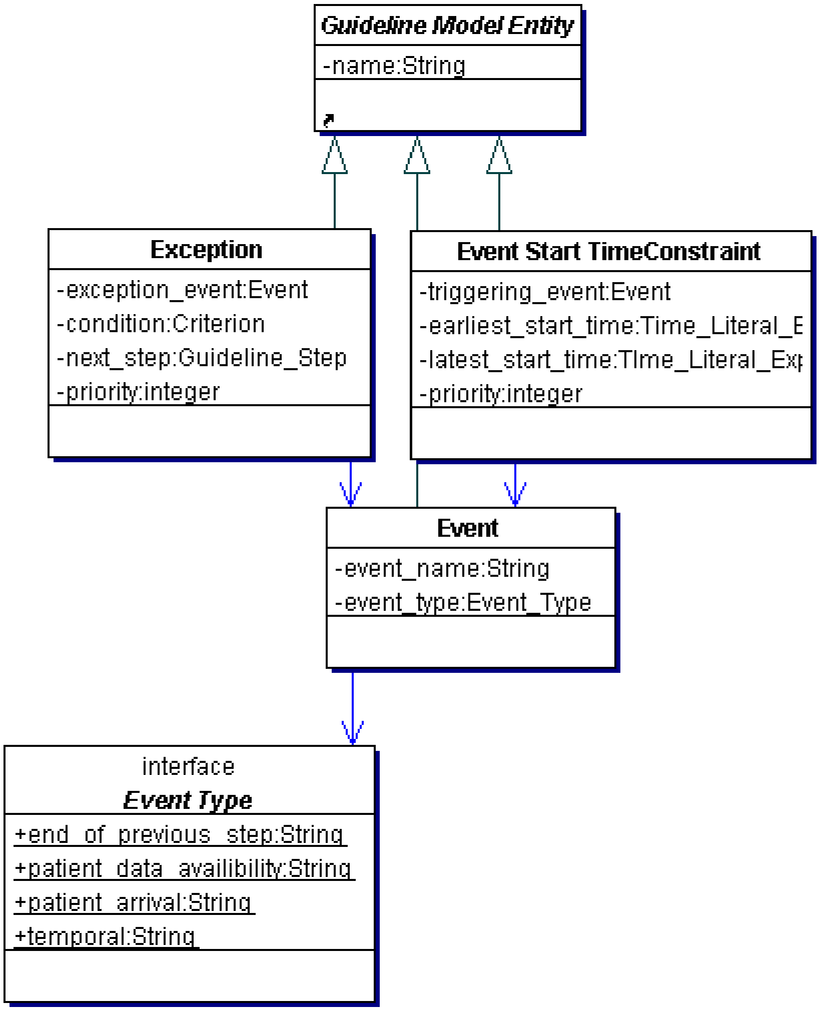
Classes

class EventsAndExCeptions.Event
class EventsAndExCeptions.Event_Start_TimeConstraint
class EventsAndExCeptions.Exception

Interfaces

interface EventsAndExCeptions.Event_Type

Class Diagram



Different Event types are defined: end of a previous guideline step, patient arrival, patient data availability, and temporal events, such as a certain point of time has arrived.

Action- and decision steps have an attribute, called triggering_events, which specifies what events trigger the start of the step, and with what temporal constraints. The triggering events are of the class EventStartTimeConstraint. This class specifies an event and the earliest and latest times after which the step should be started following the occurrence of the triggering event.

Action- and decision steps have an attribute, called exceptions, which specifies what exceptions should be checked during the execution of the step. The exceptions are of the class Exception. This class specifies the exception-event that should be checked for, a (guarding) condition and a next step. If the exception event occurs and the condition holds, then we terminate the step associated with the exception, and move on to the next step that is defined by the exception.

Interface Node Detail

Interface *EventsAndExCeptions.Event_Type*

More event types may be added.

Class Detail

Class *EventsAndExCeptions.Event*

Inherits from:

Guideline_Model_Entity

Description: This class contains a triggering event and the earliest and latest times after which a system response to the event should be generated. The event triggers action or decision steps within the latest_start_time and not before the earliest_start_time.

Considerations
Currently, complex events are not modeled. To express an event such as "1 hour after event E1", we use the triggering event as E1 and an earliest start time of 1 hour. Complex events such as "DowJones changed by 20% in any 2 hour interval" are not possible to model right now.

Attributes

event_name
event_type

Attribute Detail

event_name

event_type

Class *EventsAndExCeptions.Event_Start_TimeConstraint*

Inherits from:

Guideline_Model_Entity

Description: This class contains a triggering event and the earliest and latest times after which a system response to the event should be generated. The event triggers action or decision steps within the latest_start_time and not before the earliest_start_time.

Any of the triggering events that occur can trigger the step that is about to be triggered. In cases where several triggering events are defined (each with its own start time constraints), their priorities are compared, and the highest priority event is chosen to trigger the step.

Attributes

earliest_start_time
latest_start_time
priority
triggering_event

Attribute Detail

earliest_start_time

Data type: Time_Literal_Expression
Multiplicity: 1
Description:the earliest after which a system response should be generated after the triggering event occurred
Level: B, C

latest_start_time

Data type: Time_Literal_Expression
Multiplicity: 1
Description:the latest after which a system response should be generated after the triggering event occurred
Level: B, C

priority

Data type: integer
Multiplicity: 0:1
Description: the priority of the exception
Level: B and C

triggering_event

Data type: Event
Multiplicity: 1
Description:the event
Level: B, C

Class *EventsAndExCeptions.Exception*

Inherits from:

Guideline_Model_Entity

Action- and decision steps and the guideline class have an attribute, called exceptions, which specifies what exceptions should be checked during the execution of the step. The exceptions are of the class Exception. This class specifies the exception-event that should be checked for, a (guarding) condition and a next step. If the exception event occurs and the condition holds, then we terminate the step associated with the exception, and move on to the next step that is defined by the exception. The condition is part of the exception (and not a separate decision step which is specified as the exception's next_step) since we do not want to unnecessarily leave a step, stopping its execution, when a triggering_event occurs, unless the condition holds.

Any of the exceptions that occur can stop the execution of the current step and pass control to another step. In cases where several exceptions are defined (each with its own next_step), their priorities are compared, and the highest priority exception is chosen to trigger the step.

Attributes

condition
exception_event
next_step
priority

Attribute Detail

condition

exception_event

next_step

priority

Data type: integer
Multiplicity: 0:1
Description: the priority of the exception
Level: B and C

Interface Detail

Interface *EventsAndExCeptions.Event_Type*

More event types may be added.

Attributes

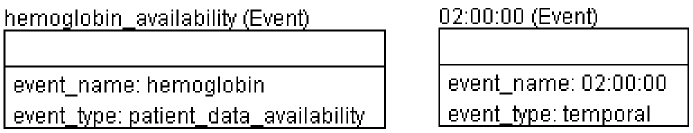
end_of_previous_step
patient_arrival

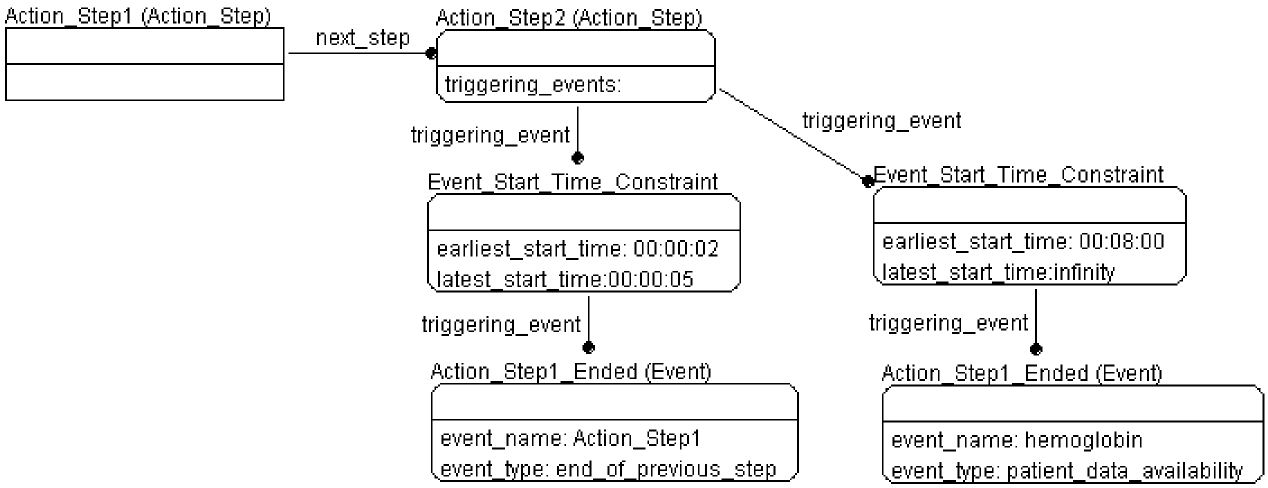
patient_data_availibility
temporal

Attribute Detail

- **end_of_previous_step**
- **patient_arrival**
- **patient_data_availibility**
- **temporal**

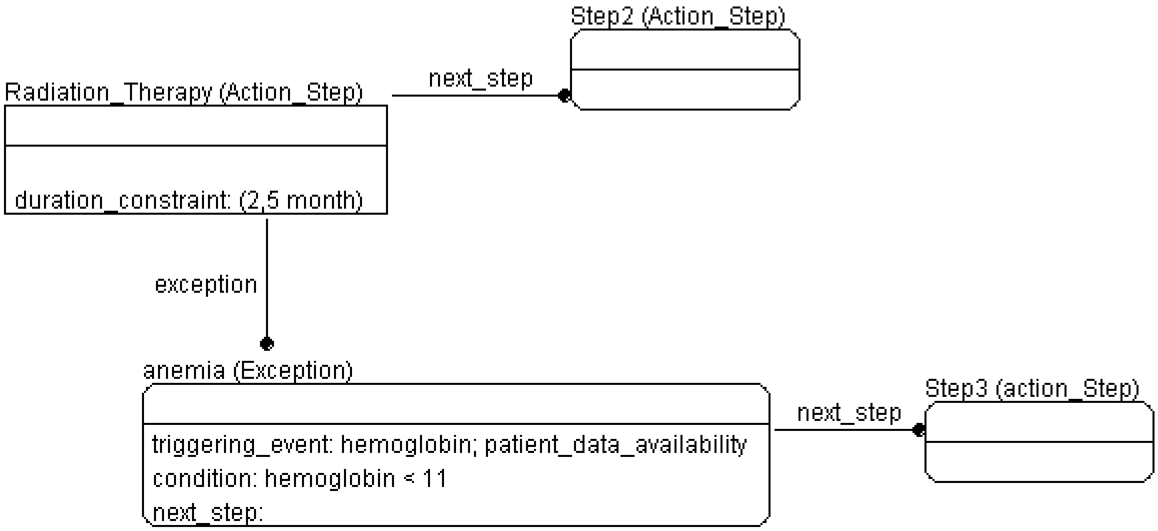
Example:




Action_Step1 (Action_Step)
next_step
Action_Step2 (Action_Step)
triggering_events:
triggering_event
triggering_event
Event_Start_Time_Constraint
earliest_start_time: 00:00:02
latest_start_time:00:00:05
Event_Start_Time_Constraint
earliest_start_time: 00:08:00
latest_start_time:infinity
triggering_event
triggering_event
Action_Step1_Ended (Event)
event_name: Action_Step1
event_type: end_of_previous_step
Action_Step1_Ended (Event)
event_name: hemoglobin
event_type: patient_data_availability

1) hemoglobin data is avialable
2) 2 am arrived
3) Action Step2 is invoked by one of two events: (a) at least 2 seconds and not more than 5 seconds after Action Step1 ended; (b) at least 8 minutes after hemoglobin data is available.

Example:


Step2 (Action_Step)
Radiation_Therapy (Action_Step)
next_step
duration_constraint: (2,5 month)
exception
anemia (Exception)
triggering_event: hemoglobin; patient_data_availability
condition: hemoglobin < 11
next_step:
next_step
Step3 (action_Step)

When radiation therapy is conducted, you check for the exception of anemia (hemoglobin result with a value of < 11). If it occurs then you go to Step3,. If it doesn't you finish radiation therapy and go to step2.