Event Recording System for Smart Space Applications

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Motivation

Smart space is a source of multiple events generated by KPs. Information, which describes the events, can be collected and used for:

- Analysis & Visualization
- Playback
- Automatical report generation
Previous Work

- HiveMind Add-on for Smart Conference System
- Pulse Monitoring for Smart Conference System

The results were presented at FRUCT 11 during the Smart Spaces section and working group meeting.
Problem Statement

Propose a general approach for registration of events in Smart-M3 environment and develop an application for such registration.

Main requirements

- Support for arbitrary events
- Configuration-based solution
- Pluggable visualization modules
Event Registration Ontology

Event Type Group

- Event Type
- hasSubEventType

- Interval Event Type
- Intent Event Type
- Event Visualization

- startIntervalTrigger
- stopIntervalTrigger
- trigger

- Event Trigger
- Event Description Query
Event Trigger

- Event trigger defines the event in terms of an alteration in the smart space
- Each trigger is associated with a set of EventDescriptionQueries intended to gather information for event description
## Application Lifecycle

### Initialization

- Read configuration (EventType, EventTrigger, EventDescriptionQuery individuals) from the smart space
- Subscribe to the triples defined in EventTrigger individuals

### Operation (on subscription notification)

- Execute queries corresponding to the retrieved event
- Collect the results of the queries execution
- Visualize the resulted event information
Example: Talk Event in Smart Conference System

Talk is an interval event:
- Start: (TS, is, \textit{number of time slot})
- End: (TS, is, done)

To construct a useful description of the event we need
- presenter's name
- presentation title
Event Recorder Configuration for Smart Conference System

**SCS_ETG**
type = EventTypeGroup
description = "Smart Conference System event group"

**SCS_ET1**
type = IntervalEventType
description = "Presentation event"

**SCS_ET1_DescriptionQuery1**
type = EventDescriptionQuery
name = "timeSlot"
query = "($timeSlotId, None, None)"

**SCS_ET1_DescriptionQuery2**
type = EventDescriptionQuery
name = "presenter"
query = "($timeSlot['is_occupied_by'], None, None)"

**SCS_ET1_DescriptionQuery3**
type = EventDescriptionQuery
name = "presentation"
query = "($presenter['presents'], None, None)"

**SCS_ET1_StartTrigger**
type = EventTrigger
operation = update
subject = "TS"
predicate = "is"
object = "timeSlotId"
object_type = literal
checkExpression = "$timeSlotId != "none" && $timeSlotId != "over""

**SCS_ET1_StopTrigger**
type = EventTrigger
operation = update
subject = "TS"
predicate = "is"
object = "over"
Smart Conference System: Visualization (early prototype)

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Future Proposals

- Migrate to Redland SIB and use SPARQL as a query language
- Implement visualization modules (e.g., mind map, HTML, online plotting)
- Try out event recorder inside Smart Room environment (joint activity with PetrSU)