

Protocol Gesticon/BML meeting, Humaine WP10 WS, Vienna, Nov 6-8, 2006 (Stefan Kopp, Univ. Bielefeld)

Behavior definitions

- Behaviors can be described on different levels of detail/abstraction. Every description level must be self-contained, i.e. levels must be independent of each other!
 - o **level 0**: behavior element with token/label along with minimal set of descriptors, e.g. target object/position/direction of gaze behavior
 - o
 - o **Higher level i**: token plus min. parameters plus some further parameters, e.g. for expressivity
 - o
 - o **Even higher level n**: detailed specification of the behavior's form
- Example:

```
<gaze id="..." target="...">
  <description level="1"> ... </description>
  <description level="4"> ... </description>
</gaze>
```
- Remarks:
 - o For level 0, we need an ontology of labels for basic communicative behaviors; let's use ISI specifications and other existing works (e.g. on gesture lexicons). Note that one can always add tokens in a namespace.
 - o We also need an ontology of basic symbols for specifying positions, directions, shapes etc.
 - o At level n, existing representations such as SSML, Tobi, etc. can be incorporated using their own namespaces; we can start with D6e Humaine descriptions of behaviors, check for completeness, unify with BML
 - o Form working groups to work out the different behavior descriptions (levels)
 - For head, torso, face, gaze, body (including locomotion), legs, hand gesture, speech + prosody, lips + audiovisual speech
 - organize as forum around special topics on Mindmakers.org, Hannes Högni as overall supervisor to make sure coherent naming conventions etc.

Events

- We need to distinguish between body (internal) and world (external) events; use a „type“-attribute and set it to “world“ or “behavior“
- Change the current <event>-element to <emit>, with further children elements to describe the actual events that are being emitted:

```
<emit start="b1.relax">
  <event id="..." type="behavior | world">
</emit>
```

Synchronization

- To define the exact timing of a behavior, specifying start and end times relative to events is required (the rest is optional); to avoid loops, refer only to past events
- How to define vague/underspecified timing?
 - o One possible solution is to use „before“ and „after“ predicates on events:

```
<gaze id="..." stroke="after(b1.relax)">
```

- Synchronization may also be specified using an embedded <synchronize>-element
 - o Add attribute for information on tolerance range and priority
- How to sync speech to other nonverbal behaviors, such that a certain part of speech could be, e.g., prolonged to meet sync constraints with non-verbal behavior?
 - o One possible solution is to insert „mark“-elements in speech and specify timing constraints on them using an extra „<synchronize> ...</synchronize>“ block, which may also contain other timing constraints

Feedback

BML should provide tags for feedback information from the realizer to the behavior planner. Distinguish between three types of feedback messages (with dedicated tags):

- <event>:
 - o Thrown when an emit tag or a sync point is reached/passed
 - o States a source (id of the emit tag or sync point) and the absolute time, referring to a time stamp
 - o Examples: <event source=“g1.stroke“ type=“behavior“ time=“123.25“>
- <exception>:
 - o Thrown when a behavior or an entire bml block is cancelled or interrupted
 - o May contain children elements to specify the problem/cause in detail
 - o Example:


```
<exception source=“behavior/bml-block id“ type=“cancelled/interrupted“
cause=“short_summary_what_happened“ time=“123.25“>
  <what ever is needed to describe the problem in necessary detail>
</exception>
```
- <warning>:
 - o Thrown when a sync problem occurred or a level of description stated in the BML request cannot be processed by the realizer

General requirements/constraints for a BML block:

- Constraint description needs to be defined
- One can have soft (open) or hard (strict) constraints imposed on the realization of a behavior or whole BML block (e.g. a certain level of description is required)
- Violations may cause a behavior or entire BML block be interrupted/cancelled
- May be specified in a <require>....</require> block, possibly combined with <synchronize> block?

Gesticon/Behavior repository:

Repositories can be used at two different stages in the SAIBA framework:

- At planner level (for relative alignment of channels in multimodal generation):
 - o Contains player and context independent, labelled form descriptions, e.g. nod (label) -- form description
 - o Meaning/function -> form mapping is outside of the repository (in the simplest case a correspondence table, but can be more complex and include form features that are required)
 - o Form descriptions can range from high- to low-level descriptions, represented (as far as possible) in BML

- Can include duration information (min, max, default) in order to know how far a gesture or gesture phase can be stretched or shrunk without changing its meaning/function
 - What is the best way to specify the relative duration of gestures/gesture phases? min, max, default in milliseconds, in size of a gesture, in percentages of individual phases, etc.?
 - This is the Humaine Gesticon as described in D6e
- At realizer & planner level (for absolute time alignment following the timing governed by speech synthesis or any other external clock):
 - Contains application- and player-specific animation files
 - Can be an interface between different kinds of animation systems
- Brigitte to set up a behaviour repository forum on Mindmakers, where aims/goals/requirements are discussed
- Level 0 as index into the repository, conceive of look-up for specific features of a required behaviour (comparable to retrieval of DB entry)

Misc:

- Marco Vala suggests to extend BML to the description of physical actions; he is willing to take care of that branch of development
- Realization units: one BML block is thought to specify one unit (chunk) of multimodal behavior, to be realized in one step
- Speech synthesis may be part of the realizer, therefore it may make sense to talk about BML before and BML after timing conflict resolution differently (see Gesticon)