The BML Sequencer: A Tool for Authoring Multi-character Animations

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The BML sequencer is a tool to allow artists to create SmartBody compliant BML [4] animation sequences for multiple virtual humans. SmartBody [3] allows for complex behavior realization, synchronizing speech recordings with non-verbal behaviors by using the Behavior Markup Language (BML) [4]. However, there remain two problems for using BML and smartbody to achieve the vision that an artist has for animating the character: the authoring problem and multi-party behavior syncronization. The BML Sequencer addresses both.

BML is not so easy for non-programmer artists to write, understand and validate. Tools like NVBG [1] can automatically generate non-verbal behavior using rules based on the words and syntactic and discourse patterns present. However these behaviors may not adequately reflect the artist's vision. The BML Sequencer allows an artist to select, schedule, and modify animations and compile the resulting animation schedules to BML and view the resulting behavior on an agent animated by Smartbody. The BML sequencer tool has a simple user interface allowing artists to rapidly realize their vision for expressive multi-character behavior by facilitating easy creation, viewing, fine-tuning and testing of complex animation sequences for a spoken audio clip, ensuring BML compliant output sequences to be used by a BML realizer such as SmartBody and supporting animation of multiple characters on one schedule. Three animation channels are provided: **Body Animations, Facial Animations,** and **Gazes.** For each, the artist can select the character to be animated, choose from a menu of animation types, and choose timing and duration.

SmartBody only allows animations for a single agent within a bml schedule. We developed a protocol for animations of other characters, using the "sbm:event" message to trigger a supplementary BML request for the subordinate behavior to another agent. This enabled us to schedule animations for multiple characters simultaneously for each utterance without becoming familiar with the underlying BML syntax. The test options "Play" and "Play All" enable the user to validate each individual animation or the entire sequence, allowing effective debugging, polishing and refining the sequences. The tool can also be used during run-time of the system, retrieving a BML schedule when presented with an FML behavior request for a specific utterance, using the same protocol as NVBG in the virtual human toolkit.[1]

[1] `http://vhtoolkit.ict.usc.edu/index.php/`

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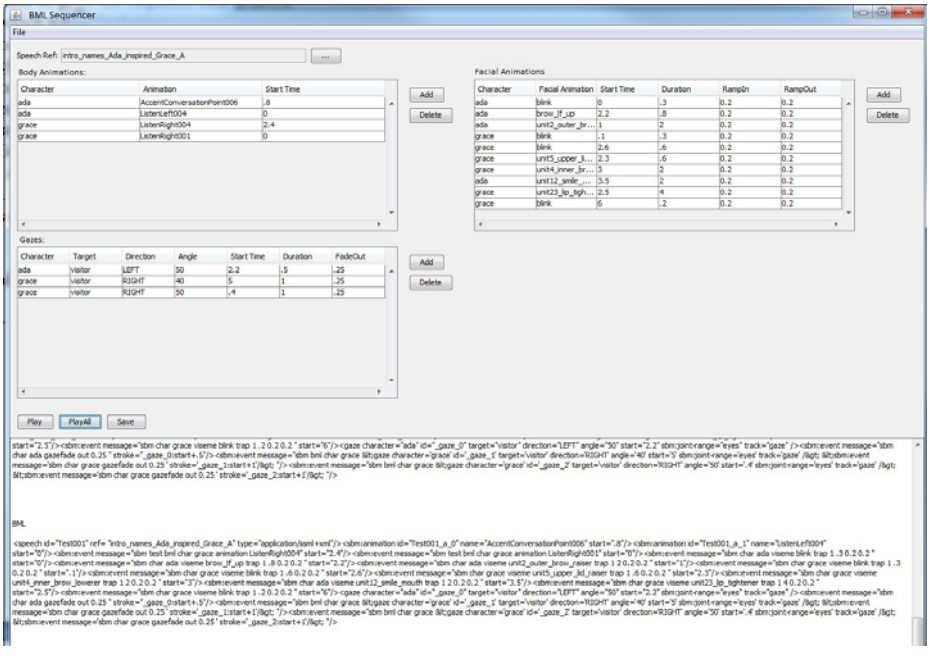
The InterFaces project,[2] a collaboration between the USC Institute for Creative Technologies (ICT) and the Museum of Science, Boston (MOS) successfully engages the visitor in an interactive exchange with virtual museum guides, Ada and Grace. The Twins domain include a finite but large set of utterances (mainly responses to questions). The initial set included 330, which was later expanded to 436. The tool used by an animator who was not previously familiar with the BML sequencing tool or BML specifications. The artist was able to understand and start using the tool effectively in less than 4 hours and do very good first pass on all 320 lines in 7 working days (ten minutes per utterance). Another animator, also was not familiar with the tool or BML specification, took over and polished the lines and added 116 more utterances in 5 days.



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