Tutorial 03

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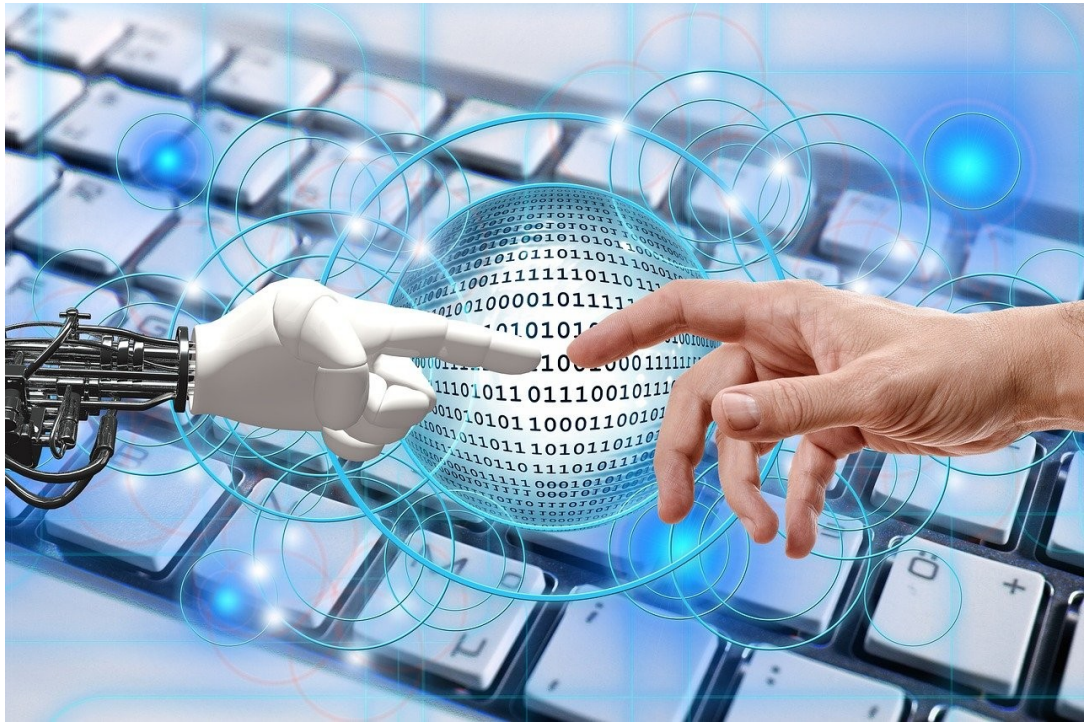


Content

- Behaviour Markup Language

Behaviour Markup Language

Introduction

The Behavior Markup Language (BML) is an XML-based language that allows behaviors to be embedded in an XML message or document.

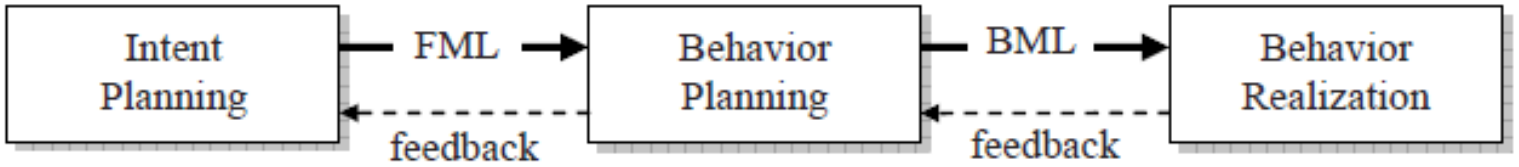
It is used to describe human nonverbal and verbal behavior for animated agents.

The BML has gained importance in many projects worldwide and continues to undergo refinement.

SAIBA Framework (Vilhjálmsson et al., 2007)

The SAIBA framework aims to create a representational framework for real-time multimodal behavior generation in embodied conversational agents.

It focuses on planning communicative intent, planning multimodal realization, and the realization of planned behaviors.



Three stages of behaviour generation in SAIBA framework

Three Stages of Behavior Generation

The behavior generation process in the SAIBA framework consists of three stages: planning communicative intent, planning multimodal realization, and the realization of planned behaviors.

The Functional Markup Language (FML) mediates between the planning of communicative intent and the planning of multimodal realization.

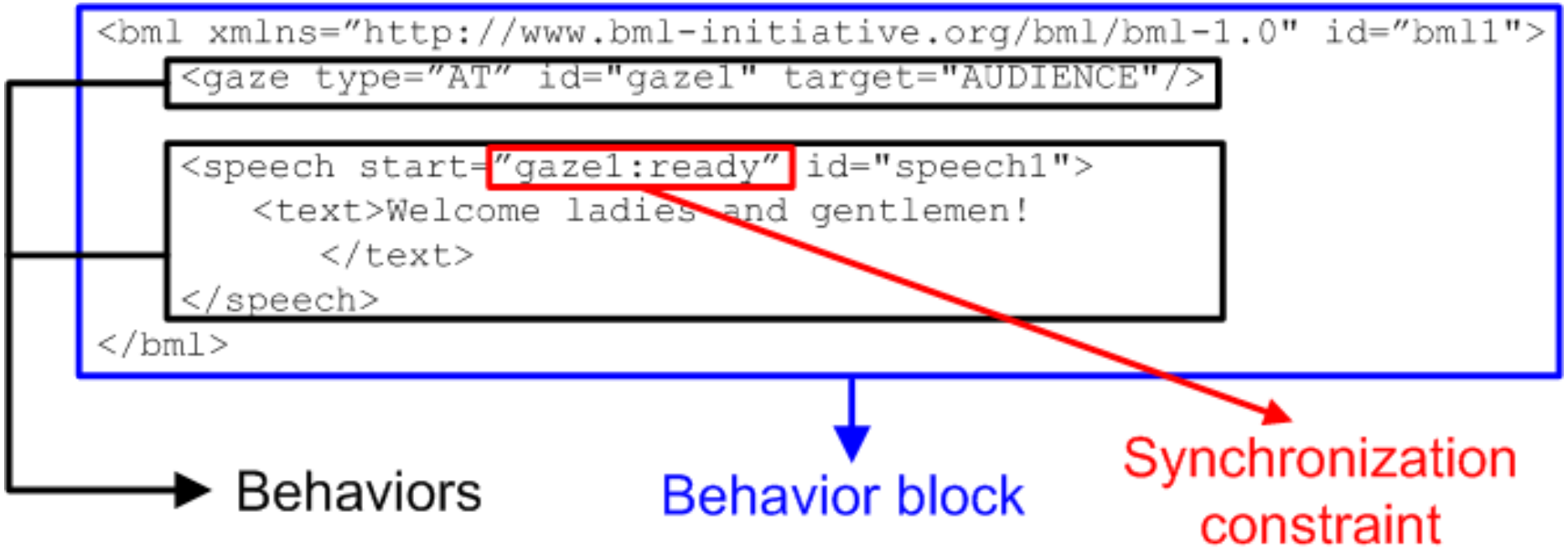
- It describes intent without reference to surface form.

The Behavior Markup Language (BML) mediates between the planning of multimodal realization and the realization of behaviors.

- It describes human nonverbal and verbal behavior in a manner independent of the animation method used.

Example

An XML description language for specifying multimodal (verbal and nonverbal) behaviors that should be expressed by an embodied conversational agent (a virtual agent or a physical robot).



Example of a BML Request [Source: Figure 1 from https://projects.cs.ru.is/projects/behavior-markup-language/wiki]

BML-based Behavior Realization

Each behavior block and behavior has an ID.

Possible types of behaviors

- Face, Gaze, Gesture, Head, Locomotion, Postures, Speech

Synchronisation constraints are specific to each type of behavior.

- Start time, end time, delays
- start time -- the start time of a block b is the global timestamp when it actually starts being executed.
- end time -- the end time of a block is the global timestamp when all behaviors in the block have ended.

A BML Realizer that understands BML requests realizes these behaviors on the agent.

Another Example

```
<bml xmlns="http://www.bml-initiative.org/bml/bml-1.0"
        character="Alice"
        id="bml1">
    <speech id="behavior1" start="0">
        <text>
        Good morning.
        </text>
    </speech>
    <wait id="behavior2" start="behavior1:end" duration="1"/>
    <speech id="behavior3" start="behavior2:end">
        <text>
        Goodbye.
        </text>
    </speech>
</bml>
```

References

Vilhjálmsson, H. et al. (2007). The Behavior Markup Language: Recent Developments and Challenges. In: Pelachaud, C., Martin, JC., André, E., Chollet, G., Karpouzis, K., Pelé, D. (eds) Intelligent Virtual Agents. IVA 2007. Lecture Notes in Computer Science(), vol 4722. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-540-74997-4_10

Thank you!

For any queries:

- LEA Forum
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