

Establishing Communication Channels for Digital Storytelling Applications

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1 Introduction

Digital storytelling refers to use digital tools so that people can tell their stories. That is, it is a technological application that allows people to communicate a *message* to other people.

Due to that reason, from authors' point of view, the selection of the most adequate communication channel should be a crucial step in order to transmit correctly the story.

This work starts from the hypothesis that a correct selection of the communication channel provides these advantages to a digital storytelling application:

- An adequate communication channel can provide a better understanding of the story.
- Users could have different preferences about communication channels. An application that is able to adapt the communication channel to their preferences will be more satisfactory for users.
- Users could have disabilities that make hard to use some communication channels, for example the voice channels for deaf people. If an application has not that into account, the story cannot be transmitted.

However current digital storytelling applications have not a way for defining the user (consumer of stories) profile in a high level way. That is, there is not a way for providing to storytelling applications with the necessary knowledge for adapting the communication channels to each user.

Moreover, if it would exist and these profiles would be standard, all applications could be adapted to users based on an unique profile.

Then, in order to give a way for specifying these communication preferences or needs in a standard way, this work proposes the use of Avatar Definition Markup Language –ADML–. It is a XML-based high level language created by this article's authors and whose first stage results were published on [3]. This language is now part of the new MPEG-V standard.

2 ADML Overview

ADML codifies the characteristics that define an avatar identity (appearance, personality and communication skills) following a similarity with the human being identity [3]. This codification is XML-compliant.

The fact of being XML-compliant, as standard for information representation, allows developers to quickly implement libraries and tools for integrating ADML in their applications.

ADML was initially designed for being adaptable to current virtual worlds. But some features as the communication skills can be clearly applied to other kind of applications, especially digital storytelling ones.

As it has been stated, ADML is composed by three main sections: appearance, personality and communication skills, following the structure of Fig. 1.

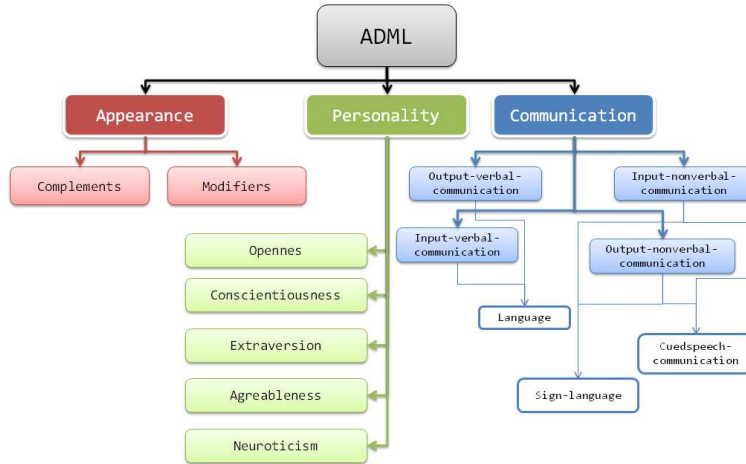


Fig. 1. ADML nodes structure

The root node is named by `adml` tag. There are three children nodes, one for each section, which can be used separately:

- In case of **appearance**, it can contain appearance modifiers or complements like clothes, jewelry, etc.
- In case of **personality**, it contains children nodes following the Five Factor model [1] in order to define a concrete personality.
- In case of **communication**, input and output channels can be specified and, for each of them, the language preferences.

3 Communication Channels

In order to obtain the features that define the communication among users, the features related with the Shanon-Weaver transmission/reception schema of a message will be specified [2]. The generation and interpretation of the message will happen in the intelligent elements (persons and storytelling components).

Features are referred as message codification and decodification options. That is, the objective is to configure a specification that allows transmitter and receiver to agree in a communication way that both of them are able to use.

Most usual communication possibilities between two (or more) persons are shown in Fig 3.

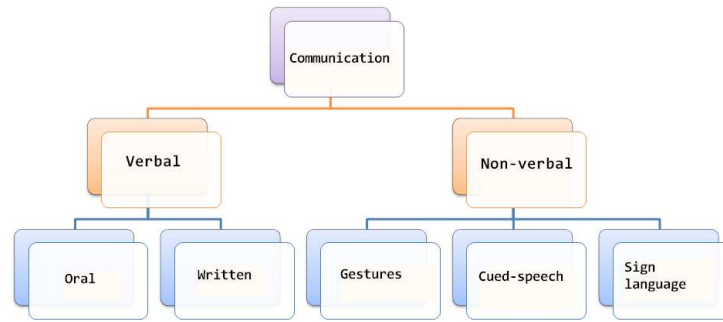


Fig. 2. Message transmission/reception possibilities

ADML defines the `communication` tag as a way that allow applications to know the communication preferences of users and to be able (or at least to be in position) of adapting their inputs and outputs to them. In this way, all the inputs and outputs would be individually adapted to each person.

Communication preferences are defined in ADML by means of two input and two output channels, guarantying multimodality. These channels are the voice and gestures recognition in case of inputs, and the verbal and gestural channels as outputs.

Basically, channels can be specified as enabled or disabled. If all the channels are active, it implies that the person is able to speak, gesticulate and recognize voice and gestures.

Moreover, in input and output verbal communication channels, text or voice preference can be specified.

Gesturing generation and recognition channels specifies three kinds of gestures: Gestures related with the speech-arising non-verbal language; sign language and cued-speech language.

All the language-dependent skills (speaking, both via text or voice, voice or text recognition, and generation and recognition of sign language and cued-speech language) include an attribute called `language` for specifying the concrete language skills.

4 Results

The ADML specification and its suitability for digital storytelling application have been tested by means of the prototype shown in Fig. 5.

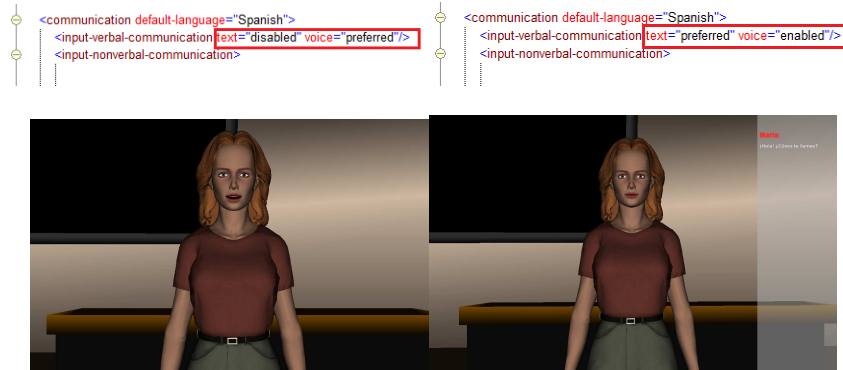


Fig. 3. Simple examples of communication preferences in ADML

The Fig. 5 shows a basic example where a character is telling a story. The story is the same but the way of transmitting it depends on the user communication preferences.

- In the first image, the user expresses through ADML his preference about verbal communication via voice. Then, the virtual character says the story speaking.
- In the second image the user has expressed his preference about verbal communication via text, although he is able to understand voice too. Then, the character says the same story via text.

This simple example is the base of the ADML applicability to digital storytelling: the same story could be individually adapted to audience communication skills.

References

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