The Muses of Poetry

Diana Arellano

Institute of Animation

Filmakademie Baden-Wuerttemberg

Akademiehof 10

Ludwigsburg, 71638 Germany

diana.arellano@filmakademie.de

Volker Helzle

Institute of Animation

Filmakademie Baden-Wuerttemberg

Akademiehof 10

Ludwigsburg, 71638 Germany

volker.helzle@filmakademie.de

Abstract

The Muses of Poetry is an interactive installation that combines dynamically generated character animation, semantic analysis, natural voice interaction and affect in poetry. Motivated by the subjectivity and imaginative character of this form of art, we intend to enhance and accentuate a poetry recital by providing a set of virtual characters the possibility to "understand" and manifest the emotional content of the poems through facial expressions and affective speech. It is our aim with this installation to bring people closer to poetry, while creating a playful, interactive and surprising experience for the user.

Author Keywords

Human Computer Interaction, Animated Characters, Real-time, Affective Computing

ACM Classification Keywords

H.5.1 [Multimedia Information Systems]: Animations; H.5.2 [User Interfaces]: Natural Language

Introduction

The idea for The Muses of Poetry originated from our previous experiences with virtual characters for film productions and interactive applications [1, 8, 9]. The acceptance of the characters by the users in all these applications encouraged us to take them to the next level: to recite poetry.

The representation of poetry is an area that has generated a number or interesting and creative works, some of which are outlined in [2]. However, few ones have dealt with the recitation of poetry, specifically using animated characters. Reciting poems out loud presents a major challenge because the reader needs to be aware of the style of the poem, the pauses, the melody and the ideas that it intends to convey. Having these elements in mind, we posed the following question: is it possible to have a virtual animated character that reads poetry? Can this virtual character make an audience connect with a poem, with its words and meanings? Can this character become a real "poetry interpreter"?

To that end, and to answer the former questions, we developed an interactive and audiovisual poetry installation, where all the processes, from the analysis of the poems to the generation of the animations are done automatically and in real-time. Moreover, by achieving a poetry interpreter, we can have characters that come up with their own interpretation of the poems, while being able to audio-visually translate the emotional meaning in them. In the following we present an overview of The Muses of Poetry, which implementation details can be found in [2, 3, 4].

How the Muses work

One of the novelties of the system is the combination of different areas like semantic analysis, real-time computer graphics, voice generation and human-computer interaction, in order to create artistic and well differentiated virtual characters that engage the user in a poetic experience. Figure 1 shows the modules that form the system architecture of the installation.

**Figure 2.** Example of Interaction
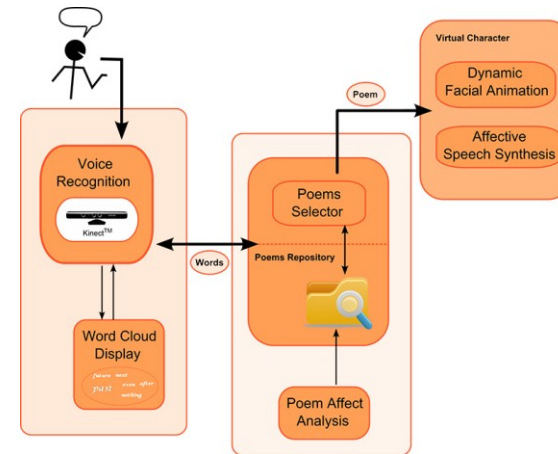
Figure 1. Modules of the system in The Muses of Poetry [2].

The interaction with The Muses was thought as a sort of conversation between the user and the character. It is initiated with the user's greeting: "*Hello Muses*". To this, the character replies: "*Hello, I am one of the muses of poetry. Select two words and I will recite a poem for you*". This was implemented in the Voice Recognition module, which makes use of a clip microphone installed in one of the slides above the head of the participant. As for the physical installation, it resembles an open book, where the user enters and interacts with the characters, as seen in Figure 2.

The pool of words available for selection is presented by the Word Cloud Display module in a "word cloud" arrangement that is generated dynamically in every interaction (Figure 2). It contains the most repeated words in all the poems in the Poems Repository. After a word is said and recognized, the selector looks for it in the current set of poems, keeping only the poems that

Figure 3. Nikita, 3D female character
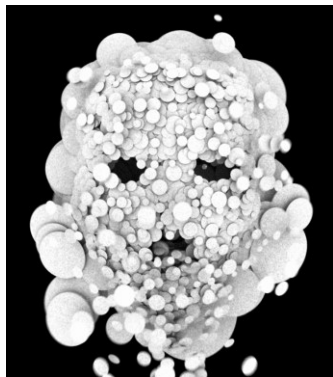
Figure 4. 3D abstract character
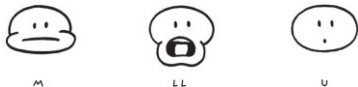
Figure 5. Myself, 2D poses for lip-syncing

contain that word. Once the two words have been said and acknowledged, the character emotionally recites the corresponding poem.

Emotions and Poetry

The Poem Affect Analysis module is the one that carries on the semantic analysis of each of the poems available in the installation, in order to automatically extract their emotional content. A detailed insight of how the module used the Whissell's Dictionary of Affect in Language (WDAL) [6] is given in [2]. However, in the current approach we considered the use of the SATI API [5], which solves issues like negation and disambiguation in the sentences. In this way, a more accurate and faster extraction of the emotions from the text is done, without bias from the human perception.

Once the analysis is finished and the emotions have been extracted, an automatic text tagging is executed to indicate the system the emotional state to manifest in different parts of the poem. Facial expressions tags contain the name of the emotional state obtained from the analysis (e.g. [synthesis:emotion id='UNPLEASANT TRIGGER' /]), which is then interpreted by the real-time Dynamic Facial Animation module to trigger the corresponding facial movements. The considered states are: pleasant, nice, fun, unpleasant, nasty and sad.

For changes in the speech, tags with prosody elements like "pitch" and "speech" (e.g. [synthesis:pitch level='79']) are added before the words with the line's prevailing emotional state: unpleasant, happy, or sad. These tags are processed by the text-to-speech tool SVOX (NUANCE), which is part of the Affective Speech Synthesis module, modulating the generated voice and enhancing the emotionality in the poem [3].

Animated Characters

As it has been previously stated, one of the main characteristics of The Muses of Poetry is the real-time generation of facial animations, lip-syncing and other visual effects to manifest the emotional states. In this way, there is no need of having pre-rendered animations for each poem. It represents a great advantage because any new poem can be added on the fly into The Muses without effort on the animation side. The development framework that provides this functionality is named Frapper [7], created at the Institute of Animation, Filmakademie Baden-Wuerttemberg. Currently, the installation counts with six characters that cover the wide spectrum of animated characters. The characters are the following:

▪   A realistic human-like female, Nikita, to whom a veil as added to make her look ancient-Greek like. She expresses emotions through facial expressions (Fig. 3).

▪   An abstract character made of disc particles, which shape the form of a human head, and are constantly moving when the character speaks (Figure 4). The speed of the particles depends on the emotion to show.

▪   A 2D cartoon character, Myself, who is a round shape with two points as eyes and a line as mouth (Figure 5).

▪   A 2D full body cartoon character, named Krel, who is a cartoonish monster (Figure 6, top-left).

▪   A character that looks like a sailor made of clay (Figure 6, top-right).

▪   A character that has the shape of a face made of branches and stones (Figure 6, down). This character together with Myself express emotions by changing the color of the scene.

Figure 6. Top left: Krel, 2D purple monster. Top right: Sailor monster made of clay. Down: Woody, character made of branches and stones,

The Exhibition of the Muses of Poetry

The installation was first exhibited at FMX 2013, the Conference on Animation, Effects, Games and Transmedia, in Stuttgart between 23th to 26th April, 2013. There the participants had the opportunity to interact with The Muses for approximately 2 to 3 minutes each.

This first contact with a real audience allowed us to perform a User Experience evaluation to assess the interaction and the emotional engagement produced by The Muses of Poetry. Although the results of the evaluation showed that the majority of the participants found the installation pleasant, inviting and appealing, we could not conclude which character performed better as a poetry reader.

However, we could see that during the interaction, the words provided by the user, more than a way to choose a poem, served as the bonding element between the user and the installation. When the participant approached the installation, the main feeling was slight curiosity. This curiosity was increased by the character invitation to say two words. Then, when the character began to recite the poem, the curiosity is intensified by the fact that the user wants to hear the words he/she said, while experiencing the poetry.

Finally, it is not our intention to replace the poet with a virtual character. On the contrary, we intend to understand the affective process undergoing the recitation of poetry and how it can be manifested through facial expressions and prosodic changes, thus we can at some point support a poetic performance.

References

[1] Agent Framework – Filmakademie Baden-Wuerttemberg. http://research.animationsinstitut.de/119.0.html.

[2] Arellano, D. and Helzle, V. The Next Generation Poetic Experience. In *Proc. ACM SIGGRAPH ASIA 2013*, ACM Press (2013) (in press).

[3] Arellano, D., Manresa-Yee, C. and Helzle, V. Automatic Speech for Poetry - The Voice behind the Experience. In *Proc. Workshop "Emotion and Computing" in KI 2013* (2013), 26-33.

[4] Arellano, D., Spielmann, S. and Helzle, V. The Muses of Poetry - In search of the poetic experience. In *Proc. Symposium on Artifcial Intelligence and Poetry* (2013), 6-10.

[5] Denis, A., Cruz-Lara, S. and Bellalem, N. General Purpose Textual Sentiment Analysis and Emotion Detection Tools. *In Proc. Workshop "Emotion and Computing" in KI 2013* (2013), 26-33

[6] Duhamel, P. and Whissell, C. The dictionary of affect in language [computer software] (1998).

[7] FRAPPER. http://sourceforge.net/projects/frapper/

[8] Helzle, V., Spielmann, S. and Zweling, N. Emote, a new way of creating animated messages for web enabled devices. In *Proc. CVMP 2011, Proceedings* of CVMP 2011 (2011).

[9] Rauh, R. and Schaller, U.M. Categorical perception of emotional facial expressions in video clips with natural and artificial actors: A pilot study. Tech. rep., Freiburg: Abt. fuer Psychiatrie und Psychotherapie im Kindes- und Jugendalter (2009).