Issue 03 Emotional IT Fellows

April 15, 2008 Volume 2, Issue 3

The CALLAS Project:
Conveying
Affectiveness in
Leading-edge **L**iving
Adaptive **S**ystems

A CALLAS Newsletter

CALLAS Conference at CIMCIM 2009

By CALLAS Editorial Board and Accademia Nazionale di Santa Cecilia

Next September the CALLAS project will be included in one of the key research topics of the CIMCIM annual meeting (http://www.cimcim2009.org), this year coming at its 50th anniversary. CIMCIM, International Committee of Musical Instrument Museums and Collections, is a committee of ICOM, the International Council of Museums, intended to foster the collaboration among musical instruments museums and to promote high professional standards in the use, presentation and conservation of musical instruments in museums and collections.

This year the conference, amongst others, will address the topic of new museums and innovative presentation of musical instruments. In this context the CALLAS project is perfectly fitted in this context as it can provide an affective and innovative way to present instruments usage and music creation to a young audience, interacting with the audience's feelings and expressions and reacting to them in real time. A specific CALLAS prototype, referred to as *Music Kiosk,* was developed taking into consideration the requirements of the Accademia Nazionale di Santa Cecilia in Rome to attract young visitors' attention and is installed at the MUSA.

The conference is co-hosted by the Galleria dell'Accademia of Florence (from 6th to 9th September) and by the Musical Instruments Museum of the Auditorium Parco della Musica in Rome (MUSA) from 9th to 11th September.

Visitors can try it directly and results of field trials will be presented at a dedicated workshop about CALLAS planned for next **September 10th**.

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On September 9th at 5.30 pm, preliminary to the workshop and scheduled in the main CIMCIM session, **Massimo Bertoncini** (ENGINEERING Ingegneria Informatica SPA, CALLAS project coordinator) will introduce CALLAS, its aims, the methodology, the core technologies developed and results already achieved .

On September 10th from 15 to 19 pm, **Antonina Scuderi** (NEXTURE Consulting srl, a CALLAS partner), Director of Communication and Exploitation in CALLAS, will chair a workshop, scheduled as an afternoon session of CIMCIM, where an in depth presentation, show and discussion of CALLAS showcases will be made, followed by a round table discussion with experts and all attendees.

:The workshop will also include the following:

Giulio Jacucci (TKK, CALLAS partner of Helsinki University of Technology) will illustrate showcases for affective Edutainment, Augmented Reality for Art and Public spaces.

Laurence Pearce (XIM, a CALLAS partner) will illustrate the Music Kiosk Showcase. How Music Kiosk installation (see CALLAS newsletter, n. 2) at the Accademia Nazionale di Santa Cecilia inspiring young people to enjoy the creation of music while exploring how emotions might affect music, will be cpresented and the audience will have the opportunity to test and see the installation live.

Stefano Roveda (Studio Azzurro, a CALLAS partner) will present the work done for the interactive installations, reacting to users' movements and voice.

Among them the piece Galileo all'inferno placed in Milan on the stage of *Teatro degli Arcimboldi* will be illustrated and validation results will be jointly commented with Giulio Jacucci; he will also describe the Orchestra Celeste installation, placed at Auditorium Parco della Musica itself, to celebrate 100th anniversary of Santa Cecilia Orchestra; and finally Euclide, a virtual animated character moving and changing appearance resulting from the inputs it receives from a human glove that captures the hand movements of an animator, which enacts a real time dialogue with the audience through the character. Euclide, which has been tested and performed at *Museo Città della Scienza in Naples***,** deals with the theme of how new and innovative communication approaches can be used within public places as museums and specially how the audience can be involved by using innovative technology, as affective interfaces: to catch and react to audience emotions could make the experience of visiting a museum something more thrilling and emotional, and, in the end, more interesting to be remembered.

Experts, external to the CALLAS consortium but involved in project subject matters and working alongside the project or participating to discussions on the C3 CALLAS Community Club (http://callaseu.ning.com/). Experts will discuss in a round table about innovative multimedia and multimodal human-computer interfaces applied to performing arts, museums, audience and spectators interfaces. Discussion about the exploitation of CALLAS results applied to communication between museum and cultural institution and active audience is a hot topic for the round table at the workshop, to debug

with attendees the truly potential of affective computing for active audiences of today, nowadays more and more open to deal with multimodal and immersive interaction. This is truly the greatest major opportunity in the next period for innovative museums to get in touch with the CALLAS project team to understand the benefits of the project outcomes applied to active audience requirements and to discuss it with early adopters of CALLAS solutions, as the Accademia Nazionale di Santa Cecilia is, not only a hosting institution of the workshop but mainly a successfully cooperating reference entity for the CALLAS project research team.

The CALLAS project team and Accademia Nazionale di Santa Cecilia kindly invite all readers to participate to the CALLAS event at CIMCIM 2009

and to visit the MUSA!

Participation to the CALLAS workshop is free of charge and it does only require you to book your participation through the C³ CALLAS Community Club pages at http://callaseu.ning.com/events/callas-workshop-at-accademia

or by emailing to info@callas-newmedia.eu.

Children go to Opera

by DIGITAL VIDEO

One of the aims of Interactive Opera is to introduce very young people to Opera. This installation meant to test the emotional involvement of the children inside this new context.

This is the reason why we decide to use 2D cartoon to represent live performance recreating characters and sceneries of famous composition from W.A. Mozart, Giacomo Puccini, Giuseppe Verdi and many others.

The installation implements different components and provides the participation of three children, each one is shot by a webcam and equipped with a microphone.

The components that interact with children are facial expression and speech sound recognition.

On a big screen is shown an "aria" whose protagonists are 2D cartoons.

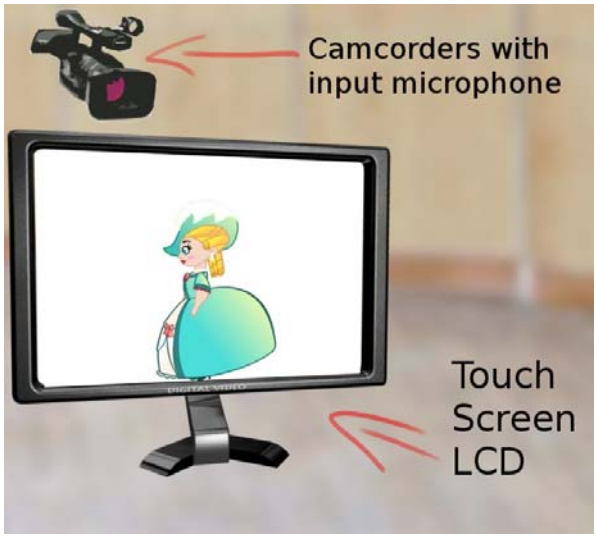
The Facial expression follows the eyes, mouth and eyebrows movement of the user, this tracking function records minimum gestures and expressions, this inputs are used to recognize the kind of emotion that the user is feeling in that very moment.

The speech recognition captures the voice and select from positive, neutral or negative inputs.

All information recorded is collected and transferred to the avatar (the characters protagonist of the animated Opera) that changes its mood according to the user emotional state.

The interactive story meant to collects emotional states with the aim of creating a custom experience for the audience. The main "media" is the user not-verbal language coded in six emotion that Paul Ekman select in "The Nature of Emotions": fear, joy, sadness, anger, boredom, surprise.

This installation is based at the Teatro Massimo of Palermo. This partnership meant to join new technologies experimentation with one of the biggest Opera House in Europe.



Specifically Teatro Massimo have a department that follows a project that involve primary school class at theatre called “Schools at the Massimo”. This was a good reason to set and test the interactive opera there in order to collect useful feedback for the overall project.

In particular the possibilities to represent opera through a visual stage allow children to join in the music using a language that they love: gaming.

This helps the mission of Teatro Massimo because interactive opera seems like a videogame for children, so they are well trained to explore the limit of the system changing expression and trying to combine different speech elements.

Also some famous opera were selected according with the opera house: Don Giovanni, Il Trovatore, Turandot, Il Barbiere di Siviglia are some of the stories that children find out inside this project.

School classes are first brought to the theatre to discover the opera and then attracted by a new way to interact with it.

CALLAS SHELF Component: the WiiGLE

By UNIVERSITY OF AUGSBURG

WiiGLE has been developed by Augsburg University and is used to classify hand movements in the three-dimensional space based on the analysis of acceleration data from *Nintendo's Wiimote controller.*

For this purpose, a general classification process pipeline has been implemented that allows to record training corpora of arbitrary gestures, train classifiers, and then use these classifiers for online recognition of gestures.

The Wiimote uses accelerometers to sense its movements in 3D space. The controller is able to connect via Bluetooth to a common PC.

The acceleration data is gathered for each direction (x: left/right, y: back/forth, z: up/down) with a sampling rate of 100Hz. To allow for fast and simple use of the Wiimote in a number of different applications, we developed the *WiiGLE environment.*

It allows defining arbitrary gesture classes for an application, selecting features for the classification task, training and comparing classifiers, and using it as the classification component of an application. It provides a programming interface to define own features and classifiers.

In principal, we can distinguish between two ways of interpreting gestural behavior of the user:

(i) how a gesture is performed by the user, and

(ii) what gesture is performed by the user.

How a gesture is performed can best be described by expressivity parameters which can be mapped onto emotional dimensions.

To test the feasibility of this approach, the parameters power, speed, and spatial extent were chosen.

However, the WiiGLE environment allows a developer to easily include further expressivity parameters, such as fluidity or overall activation.

Among other things, WiiGLE has been used in CUBE-G, a project on cultural training funded by the German Science Foundation. Within CALLAS, the component has been employed in the ElectroEmotion showcase (cfr. *CALLAS Newsletter Volume 1, Issue 1*).

Matthias Rehm, Nikolaus Bee, Elisabeth André. Wave Like an Egyptian — *Accelerometer Based Gesture Recognition for Culture Specific Interactions*. In Proceedings of HCI 2008 Culture, Creativity, Interaction, (2008).

CALLAS SHELF Component: the Emovoice

By UNIVERSITY OF AUGSBURG

EmoVoice is a framework developed for emotional speech corpus and classifier creation and for offline as well as real-time online speech emotion recognition.

The framework is intended to be used by non-experts and therefore comes with an interface to create an own personal or application specific emotion recogniser.

Thurid Vogt, Elisabeth André, Nikolaus Bee.

EmoVoice - A framework for online recognition of emotions from voice.
In Proceedings of Workshop on Perception and Interactive Technologies for Speech-Based Systems, Springer, Kloster Irsee, Germany, (June 2008).

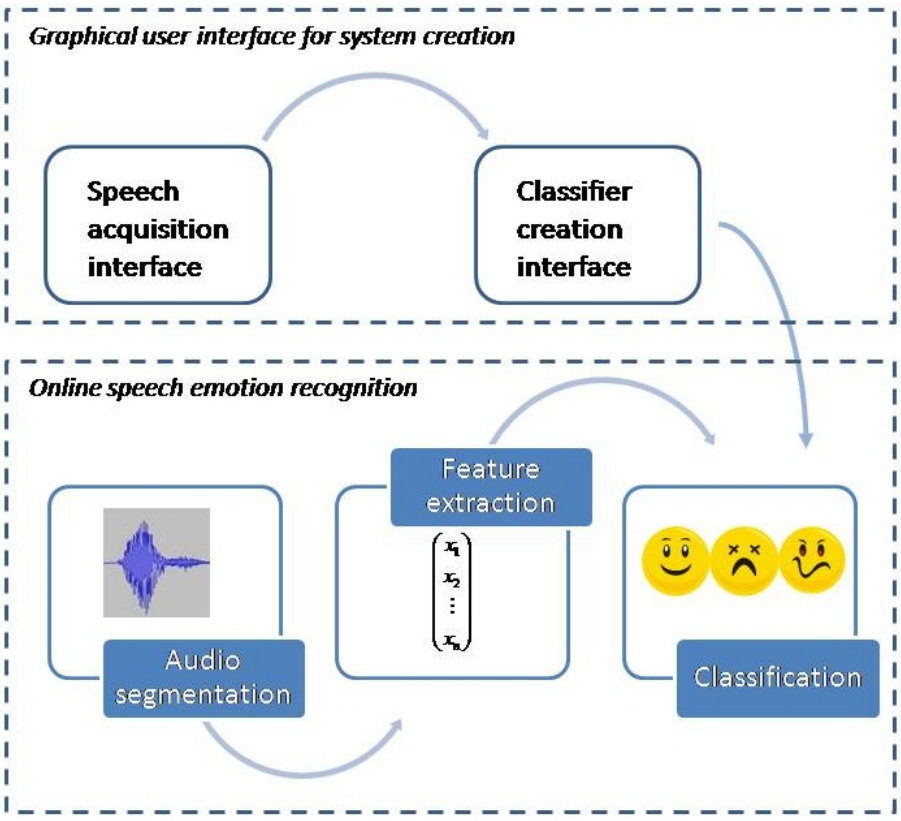
EmoVoice uses a statistical approach to classification.

That means, a vector of emotion-relevant acoustic features (e.g. derived from pitch, energy, voice quality, pauses, spectral information) is extracted from the speech signal and assigned an emotion label by a statistical classifier (here Naïve Bayes or Support Vector Machines).

The classifier is trained by examples, which means that in order to be built, it needs a database with emotional speech.

In EmoVoice, classifier creation is supported by a user interface that allows recording a database of emotional speech, by reading a set of emotion inducing sentences or free speech input. With a second interface, a classifier can be trained, and a quality check of the classifier can be performed.

The resulting classifier can then be used by a command line tool that continuously classifies user speech (without push-to-talk) and that can be linked to any application by socket communication.



Thus, personal or application-specific recognizers can be built without deep technical knowledge of the recognition process.

The component has been applied in several CALLAS showcases, such as the E-Tree, Galileo, EmoEmma, ElectroEmotion, PuppetWall, and MusicKiosk.

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- VTT Technical Research Centre of Finland
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