DIGITAL MEDIA DOCTORAL SYMPOSIUM

futureplaces

Porto, 17th October 2012

UT Austin | Portugal

INTERNATIONAL COLLABORATORY FOR EMERGING TECHNOLOGIES, COLAB

Communication design as a strategic constituent for the development of organizations – the input of digital media. **The Stories of Chairs project.**

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This research project aims at demonstrating communication design as strategic constituent for the development of organizations. In the framework were creativity develops, digital culture –and its dynamic relationship with design and visual communication– has generated a new border area, significant for the construction and interpretation of communication.

From here, we ought to understand and reconsider the communication design paradigm, analyzing its variables that allow creating value and difference in an integrated and global communication design framework of a participatory creative endeavour. It discusses design, communication, digital media participation, local cultures and creativity, focusing on the Stories of Chairs case study.

Stories of Chairs, a empirical-based case study of creative communication, is part of a larger event of promotion of design and creativity, entitled Art on Chairs. The framework is global and the aim of this ambitious endeavour is to motivate, mobilize and inspire, as it connects creative practices with traditional economic and industrial activity.

One of the strategic vectors towards the involvement of local community and attainment of an international audience is participatory digital media. Stories of chairs is a participatory digital platform of communication narratives around the chair. It's a case study on participation in new media, which wants to be creative in its content and contributive in its propose. Social networking and web 2.0 are the prime vehicle to promote the initiative, where it's acknowledged that digital media is the constituent and promoter of contemporary social, cultural and economic development – the narratives, both global and local, now produce profound changes in the paradigms of semantic communication and social structure, adding emotional, humorous and regenerating dimensions to the fostering of narratives that is desired for local furniture industry through design. If recognized as a constituent for innovation, competitiveness and development of organizations, which challenges are prompt to a region whose main productive factor suffers from a deficit of competitiveness and symbolic value?

From here, it becomes necessary to understand and reconsider the communication design paradigm, analyzing its variables that allow the creation of value and difference in an integrated and complete communication design program of a participatory creative endeavour. With the engagement of people and organizations that digital media promotes, Stories of Chairs will help promote the local industry, will foster the sharing of life stories, but most particular will bring people together through their creativity and participatory communication, in a mediatized context.

It is necessary to understand and reframe the panorama of contemporary digital culture, analyzing the main variables to evaluate and generate the difference and notoriety at the level of audiences, industries and markets.

By its nature and vocation, Stories of Chairs is articulated in partnership with the digital media festival futureplaces, an outreach event from the UT Austin | Portugal Digital Media Programme.

Filipe Cunha Monteiro Lopes
PhD in Digital Media - Faculty of Engineering of Porto

Space and Music Composition
time manifestations for music generation

The relations about space and music, especially electronic music, have been mostly emphasized on sound analyses (ex: in the acoustical domain), spacial qualities of music compositions (ex: soundscapes, sound movements...) and spatialization of sound (ex: quadriphonic system, loudspeaker orchestras, wave-field synthesis...). These are the recent cases on the most important conferences on computer music. There is sparse investigation on how space attributes can generate music in real-time, in which sound is used both as acoustical source measurement and expressive element, while enhancing space awareness and sonic identity.

The purpose of this research is to compose/design three site specific sound interactive installations, focusing on acoustic data, while shedding light on the topic of site specificity for music. Making use of new technology, algorithmic programming environments and the advances in room acoustics, these three installations will use sonic elements, collected in real time from the space, to store data which will be analysed and used to generate music while enhancing immersive sound and space experiences.

What is music site specific? What are the sonic personalities of each room and space? Does sound helps characterizing a space and what information is unveiled with sound? The context of aural architecture, ambient music, site specific art, multimedia installations and music composition sets the background for this thesis and investigation. To design the installations for each space, social aspects and soundscapes will be considered, based on readings considering site specificity. While taking into account the fact that spaces have a social musical meaning which helped shaping music history, this investigation will primarily focus on sonic elements retrieved in real time and how they can contribute to an interactive music algorithm. The focus will be on resonant frequencies and reverberation, implying that a site, or space, within the scope of this investigation is considerer a closed area and all visuals aspects are neglected.

Following the premisses stated, this research will focus on the following works: “Music for airports” by Brian Eno “I’m sitting in a room” by Alvin Lucier “Hear, Being Here” by Liminal (David Prior and Frances Crow).

This work will provide artists various possibilities on sound and space relations within interactive music system. These include the use of space as a real-time instrument and how to use real-time sonic data for automatic music algorithms. In addition, this investigation will provide ideas about site specificity and sonic identity.

“The real revolution in musical space may, in fact, be that space becomes a real-time artistic activity. Becoming an aural architect of music spaces thus becomes possible, as well as important, unlike previous periods where space was a building that lasted centuries”

(Blesser&Salter, 2007)

“But perhaps this is also because we are not sure what space really is, in sonic terms, or that we lack a sufficiently comprehensive bundle of concepts to talk about it, or that we think it tangential rather than central”

(Smalley, 2007)

Robots and performers

How can Theatrical Robotics research and creation be a territory of experimentation for social robotics development?

Fernando Nabais[1]

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Introduction

Robots have until recently been mainly confined to human safe protected areas in factories or to the ingenious imagination of sci-fi writers, when it comes to naturally interact with humans.

Since robots started to leave their original workplaces and moved on to share space with humans, new and critical challenges emerged for roboticists.

From the structural technological challenge of its sheer mechanical and control systems, the step into a social context requires a call upon many different science fields, besides its strict engineering components.

Human-Robot Interaction research involves various different knowledge areas like cognitive science, human factors, natural language, psychology, among others.

Artists have also been seduced by machines and particularly robots has a new medium to create and reflect upon.
Recently, theatre - and performance in a broader sense – became an important trend in HRI research. On one side, there´s the temptation to create credible artificial life . On the other, theatrical live performance represents an interesting territory, from which compositional principles, techniques and methods can be transferred to obtain inspiration and guidelines for HRI design.

Objectives

This research´s objective is threefold:

- To develop a performance object involving human and robotic performers
- To research robotic expression in appearance constrained robots
- To investigate and assess possible transfer methodologies from theatre and performance to Social Robotics

Method

The strategy is to develop a multi-disciplinary practice based research through directed experiments. These experiments will be iteratively incremented and assessed regarding their narrative and social potential.

HCI and HRI have been recurring to cognitive models to improve interface design, employing simulated users to explore and assess the effectiveness of human interfaces with computational devices. Several cognitive software architectures have been developed that provide great flexibility in the modulation of different user profiles represented by computationally modeled cognitive models.

Performers are trained, not to simulate, but to incorporate a large range of characters, each, with their own cognitive model and embodiment. In HCI/HRI, performers can provide a simple way to easily access a vast plethora of movements, behaviors and characters and can be understood as the simulation architecture where to apply a cognitive model of a user/character.

In this sense, trained performers may be considered as user modeling simulation “architectures” and represent an example of a possible correspondent concept from theatre and HCI to explore in this research.

Acknowledgements: Prof. Stephan Jurgens, Prof. Nuno Correia, YDreams informática S.A.
Pictures from author´s previous work *.txt* featuring performer Pedro Ramos

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Optimized Facial Rigging for Key Frame Animation

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Abstract

Facial rigging involves planning and setting the mechanics and controls to animate a character's face. This is a laborious and time-consuming process for digital artists which is opened to significant improvements. This Ph.D. research aims towards the deployment of generic and certified facial rig mechanics and controls as optimized open-source design approaches that improve facial rigging for key frame animation.

Introduction

Animated characters are valuable assets for the entertainment industry of films and videogames because they captivate an audience by expressing their emotions. They do it mostly using their face, through the animation subtleties in their eyebrows, eyelids, eyes, nose, cheeks, mouth, lips, etc. However, controlling the facial animation of characters is hard because they require facial control systems, called facial rigs, that accurately support their morphologies and behaviors.

The question that drives this research is the following: is there a generic and certified rigging method that guarantees the accurate control and the subtle deformation of a character's face?

State of the Art

The rigging job emerged in the mid 90s [1] due to the increasing need for characters to perform complex facial animation for breakthrough feature films; the earliest example being Pixar's [2] full length feature film Toy Story [3]. Rigging became a fundamental stage in character production pipelines because, as illustrated in Fig. 1, rigging bridges the gap between the modeling and animation stages within a professional character production pipeline [4].

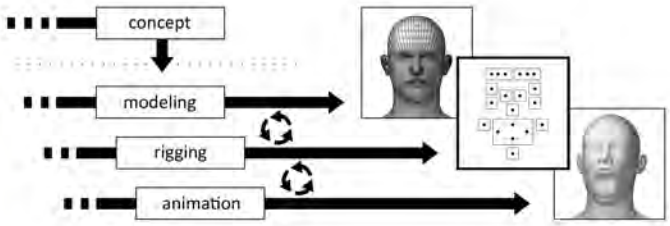

Fig. 1: A facial rig interface within a professional character production pipeline.

The artists who rig characters are called character setup artists, or riggers. Riggers use 3D tools such as Autodesk Maya or Blender to create character rigs. Each tool has its own workflow but similar rigging concepts and techniques. The rigger plans the concepts and then implements them via the techniques. A conceptual plan provides the rigger an overall realization of how the rig should be integrated with the facial model, after which the rigger begins setting the techniques, which involves the actual building of the rig mechanics and controls. In analogy to a car, the rig mechanics would be the engine whereas the rig controls would be the steering wheel, pedals and gears. In this sense, the character rigger would be the mechanic and the character animator the driver.

Riggers creatively combine the rigging techniques depending on (i) their experience, (ii) the unique morphological and behavioral characteristics of the character, (iii) feedback from the animators and (iv) the media that the character is meant for: off-line or real-time (respectively films or videogames). For a more detailed description of the state of the art please consult our generic survey on facial rigging [5] and our specific description of facial rigging for key frame animation [6].

Methodology

Our early prototype results of a dynamic facial rig [7] and of a facial rig design approach [8], the latter including a pilot study with three animators, revealed that an optimization of the rig mechanics and controls for a character's face with human features was worthy of further investigation.

Currently, it is clear to us that a rig specification of the complete morphological and behavioral set of the human face is both achievable and appealing to the entertainment industry. We have achieved this specification in terms of the rig mechanics and we are now working on the rig controls, both oriented towards key frame facial animation due to this technological branch being at its peak of growth, thus more prone to welcoming a rig construction convention holding the necessary parameters that guarantee the accurate and subtle deformation of a character's face.

The method is being based upon scientific and artistic references that categorize human facial behavior (e.g. [9-11]) and that describe various facial rig design approaches (e.g. [12-14]). Fig. 2. shows an example of a rig specification we designed using a set of eight control points to handle the behavior of human lips; in this case used to guarantee the accurate control and subtle deformation of the lips of an older man's character face.

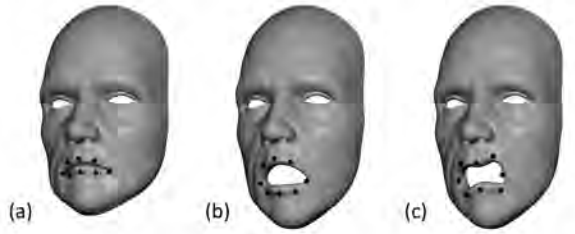

Fig. 2: A rig control points specification to handle the lips of an old man's face: (a) neutral pose, (b) lips reaction to jaw motion, (c) lips artistic refinement.

Conclusions

While the morphologies and behaviors of anthropomorphic characters remain desirably diverse and unpredictable, they are still expected to have human features in order to be identified by an audience as expressive characters. Hence, the definitive focus of the research method is the definition of a human facial rig design approach for key frame animation as a step forward towards a generic and certified rigging manual for the artists.

Acknowledgments

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Interface Design for Interactive Television

Towards a methodology to develop and evaluate Interactive Television through a User Experience approach

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Digital Media PhD: Production of Audiovisual and Interactive Content

"Emotions, we now know, change the way the human mind solves problems – the emotional system changes how the cognitive system operates. So, if aesthetics would change our emotional state, that would explain the mystery"

(Norman, Ortony, & Russell, 2003)

Abstract

Both television and interactive domains are reciprocally growing as nowadays television is becoming gradually more interactive. Internet broadband technologies are defining a new age in the delivery of content and this is affecting producers, packagers, developers and users (AFDESI, 2012). This research aims to develop design guidelines and consolidate evaluation methodologies of user interface design for interactive television, centered on a User Experience[1] approach and regarding an iterative software development framework, regarding this new reality.

The research background relies on the exploitation of the potential of new trends in media production and consumption by conceiving an on-demand immersive-TV framework combining TV industry, Internet distribution models and end-user's needs, interests and expectations, combined with an advanced high definition (HD) screening, immersive and participatory environments through ubiquitous computing, leveraging to a more interactive, engaging and satisfying interactional experiences for the user.

Within this context it is expected to develop an interactive television interface and an adequate design method, regarding the mentioned strategic inputs, through a User Experience approach, where the user experience is in the center of the design process and *"the central concern is how to design for people – for their physical and emotional needs and increasingly for their intellect"* (Verplank, 2003).

Research Question

"How to structure an effective methodology in the development of interface design for immersive interactive television that considers a ubiquitous computing point of view and the user experience as it main focus?"

Objectives

1. Get an overview on the state of the art in interface design and interactive technologies industry at the present time;
2. Study the main paradigms in the development and design of interactive content, particularly for interactive television, focusing equally in industry as academia breakthroughs;
3. Design an interactional model system for interactive television considering the end-user's needs and interests combined with advanced high definition screening, immersive and participatory environments through an ubiquitous computing approach;
4. Set a framework to create a development model and evaluation system of interactive TV interface design contemplating the user experience in the design process;
5. Validate a methodology for creating and developing interfaces for interactive television through a user experience approach;

Further Developments

→ *Consolidate main assumptions;*

→ *Identify and segment users;*

→ *Define user needs;*

→ *Structure information architecture;*

→ *Achieve a navigational map;*

→ *Establish a visual layout concept;*

→ *Enroll Ux tests;*

→ *Elaborate (re)design guidelines;*

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[1] Broadly, the term User Experience can be defined has "*the creation and synchronization of the elements that affect users' experience with a particular company, with the intent of influencing their perceptions and behavior"* (Unger & Chandler, 2009). For this research, User Experience is more understood has *"a consequence of a user's internal state (predispositions, expectations, needs, motivation, mood, etc.), the characteristics of the designed system (e.g. complexity, purpose, usability, functionality, etc.) and the context (or the environment) within which the interaction occurs (e.g. organizational/social setting, meaningfulness of the activity, voluntariness of use, etc.)"* (Law, Roto, Kort, & Hassenzahl, 2008).

This research is being developed in compliance with *the "ImTV - On-Demand Immersive-TV for Communities of Media Producers and Consumers"* international research project coordinated by the Research Center for Informatics and Information Technologies *(Centro de Investigação em Informática e Tecnologias da Informação - CITI)* of the New University of Lisbon Science and Technology Faculty *(Faculdade de Ciências e Tecnologia da Universidade Nova de Lisboa).* Acknowledgments to Teresa Romão, thesis supervisor, and to the remaining members of the ImTV research group, particularly Nuno Correia and João Magalhães.

3DLP: Mask Projection Stereolithography (MPSLA) Desktop 3D Printing System.

Author: Henrique Manuel Carvalho de Sousa Serro

Abstract

Architects, designers, sculptors and artists in general often have to deal with the laboring task of prototyping projects and ideas into material objects. 3D Printing is a fast-growing tendency in the prototyping process, however, the current commercial 3D Printing Systems offered to artists capable of such task are unreliable as they require a fair amount of maintenance and are extremely large and expansive. More affordable systems are starting to flourish in this recent market, but they lack the necessary printing quality to respond to artists needs.

Technological achievements in the area of optical projection systems made the pioneer Stereolithography process evolve, thus arising the Mask Projection Stereolithography (MPSLA) process. This research thesis will culminate in the outline of a new methodology using the MPSLA process materialized in the deployment of a reliable and intuitive desktop 3D Printing system for artists to print three-dimensional physical objects in a single autonomic operation.

Objectives

The expected contribution of this research thesis is to understand the MPSLA process and enhance it by developing a reliable, low-cost and intuitive Desktop 3D Printing System to be used as a tool for artists to develop rapid prototypes of their works and ideas.

By the end of this thesis the following objectives will have been achieved:

1) Study and analysis of the current state of the art on 3D Printing hardware and software methodologies and techniques.
2) Study and analysis of the requirements for 3D Printing technology in the scope of the artists needs.
3) Define a method for model separation between layers in bottom-up approach.
4) Fast method for slicing triangle mesh models.
5) Deploy a fully operational high-quality Desktop 3D Printer prototype.
6) Deploy a user-friendly software tool to visualize 3D models and command the printing process.
7) Validation of the tools and methods with different subjects.
8) Deploy complex shaped prints (filigree or tangled shapes) as proof-of-concept art pieces.
9) Review obtained results among peers in rapid prototyping or contextual design national and international conferences, gatherings and related venues.

The main contributions of our research are:

1) The creation of software for visualizing, manipulating and preparing a digital 3D model for printing.
2) The presentation of a methodology for converting digital 3D files into physical objects through MPSLA.
3) The design of the automated mechanism that will convert the digital models into physical prototypes.

The multidisciplinary nature of this research thesis presents a good challenge and opportunity to relate scientific and artistic studies in a collective and collaborative effort. This relation represents a global objective that not only can bring good results to this research thesis as it can also help understanding the needs and characteristics of each type of research.

The methodology for developing this research thesis was divided in four phases:

• Phase 1 – Planning/Understanding

The first stage of this research thesis focuses on studying software Interface Design (IxD) and User Experience Design (UxD) techniques/ methodologies and getting familiar with the State of the Art in Human-Computer Interaction (HCI), Stereolithography (SLA), Mask Projection Stereolithography (MPSLA) and 3D Printing interfaces/mechanisms by exploring the characteristics and demands implied. In this phase we will also study the artists needs and requirements in a 3D printing system and the capabilities/characteristics/features that this system should have.

• Phase 2 – Understanding/Experimentation

In the second stage we will aim to continue exploring the techniques/ methodologies mentioned above, but with more focus on MPSLA and the particularities and problems that this process implies. Additionally we intend to start the development process both the hardware and software demands of this research in close relation with the target audience needs.

• Phase 3 – Experimentation/Execution

In this stage we will concentrate in developing new strategies and generating new kinds of UXD paradigms and HCI interfaces by binding the results of the first two years, after collecting enough information of what is involved in the subject. By the end of this stage we should be able to deploy a prototype version of our initial goal, a fully operational 3D Printing System.

• Phase 4 – Validation/Documentation

After collecting all the information and knowledge from the prior stages and elaborating the working prototype, this will be the time to dive into the interpretation, documentation and validation of all the results achieved to be able to draw a sustained conclusion. After the completion of the prototype 3D printing system, we will design and print complex structures using filigree and tangles meshes techniques to be used as a proof-of-concept and display the capabilities of the developed system.

Impact and Repercussions

Besides contributing furthermore with the development of desktop 3D Printing systems, therefore benefiting the general public, this can culminate in a new tool that will improve the quality of life and work of people in areas related to artistic creation such as architecture, sculpture, design, animation, cinema but also to health and scientific related areas such as medicine, orthodontics, and engineering.

The repercussions that this research thesis can generate include:

Technology - faster development of products at a lower cost.
Entertainment Industry - mainly in theater, cinema, animation.
Academia - by bringing new methods and guidelines to usability, HCI, SLA and general 3D Printing
Environmental - reducing resources consumption related to distribution

Mask Projection Sterelithography (MPSLA)

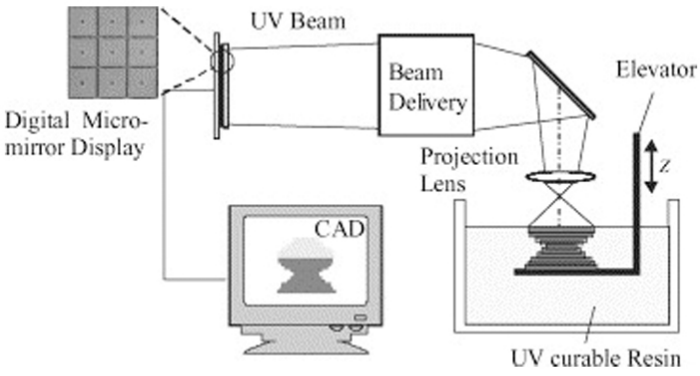

Image source: Sun C, Fang N, Wu DM Zhang X.
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SOUND + VISUALS + MOVEMENT

Rodrigo Carvalho // Digital Media Doctoral Programme // U. Porto - UT Austin-Portugal

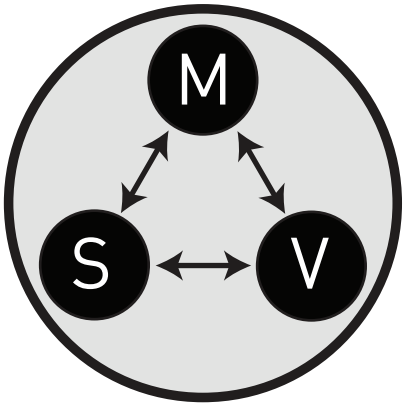
SYNERGIES BETWEEN SOUND, VISUALS AND MOVEMENT IN REAL TIME AUDIOVISUAL INTERACTIVE SYSTEMS

There has always been a dream to create the perfect synergy between sound, image and movement.
Audiovisual environments have been since long ago explored by artists, scientists, designers, engineers, and others, to create augmented realities and temporary autonomous spaces.

We can resume an audiovisual interactive systems in three main elements: *Sound*, *Visuals* and *Movement*. Each one of these elements can be either an input or/and an output of interactive data on the system. They are linked between them in different configurations and form a triangle where the interactivity data flows in different ways, depending on the characteristics of the audiovisual interactive system.

Different configurations will define how the interactive data flows through the system and will result also in different ways of relationship between system and user. In some systems the user position data (x/y/z position, velocity, …) might be use to generate sound, while in others image data (shapes, colours,…) might be used to move kinetic sculptures or to change sound dynamics.

The data collected its abstract, just numbers, without form. When the data is interpreted, it achieves a new form, a new meaning. Different media gets different interpretations from the same data.



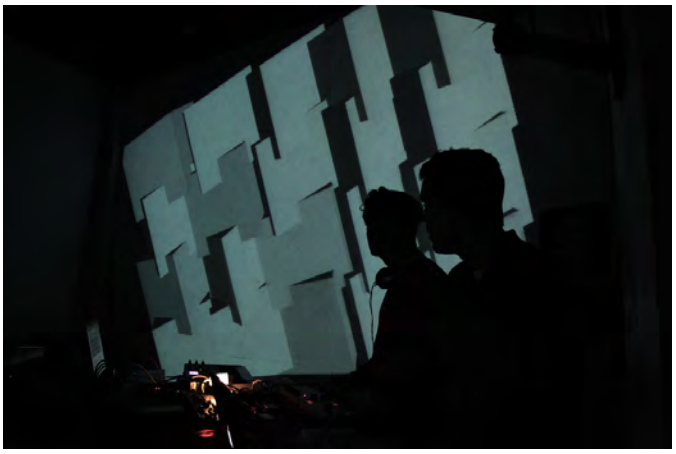
// [S] Sound / [V] Visuals /[M] Movement. Triangle of the Input/Output relationships inside an Interactive Environment;

PREFALLL135

by : Javier Chavarri, Katerina Antonopoulou, Rodrigo Carvalho

Interactive audio-visual installation that uses the energy of falling water to make water mils rotate. The data from the mills rotation is tracked and sent to the system to generate and control sound and visuals.

BORIS CHIMP 504



by : Miguel Neto, Rodrigo Carvalho

Audiovisual live performance where the sound frequencies are analysed and used to create and control visuals.

CURRENT AND FUTURE WORK

My research is focused on exploring techniques, methodologies and languages of graphic representation of the sound and movement in real time, with the objective to apply them to interactive experiences, audiovisual installations, and to musical, theatre or dance performances, and transmit to the audiences an hyper sensory and emotional state from the performance. Next year I plan to continue my on going work and experiment new Interactive Audiovisual environments with the aim to explore new synergies, mapping metaphors and interactions between sound, visuals and movement.

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Professor Associado Convidado,Mestrado em Multimedia e Programa Doutoral em Media Digitais,
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ARTiVIS

Arts, Real-Time Video and Interactivity for Sustainability

Mónica Mendes
FBA/UL and CIEBA

THESIS ADVISORS » Nuno Correia [FCT/UNL] | Sílvia Chicó [FBA/UL]
PhD in Digital Media [FCTUNL] | UT Austin-Portugal Program

ARTiVIS proposes to investigate innovative concepts and design methods regarding the use of real-time video for artistic exploration on environmental causes. We can also play a role as promoters of change in people's behavior for forest protection. Can Digital Art foster awareness and respect for nature?

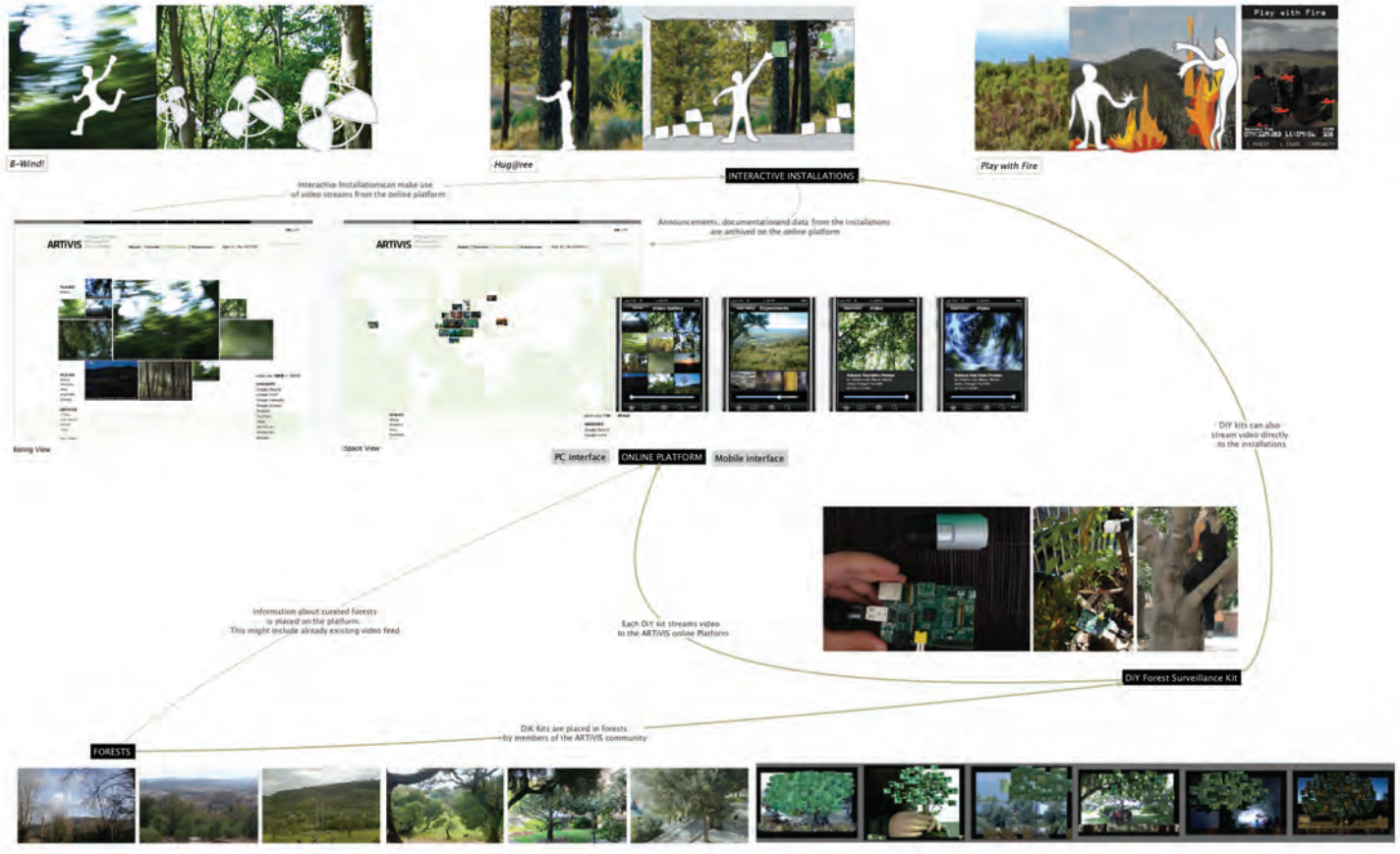
We seek to contribute with a constructive approach to the destructive dynamics of fire that aggravate Climate Change, by addressing artistic, scientific and technological dimensions of the challenging issues explored in this research.

In order to test and progress the ARTiVIS research project, interactive installations using real-time video as raw material were created. *B-Wind!*, *Hug@ree* and *Play with Fire* were the three ARTiVIS experiences developed, publicly presented and evaluated.
The ARTiVIS system accomplished in the scope of this research also comprises the concept design of an online platform and the hardware prototype of an open source forest surveillance kit that will connect to the platform.

The aim is to stimulate awareness and prevention of fire related damages to the forest.

Interviews were conducted in order to validate the theme and to inspire the developments of the ARTiVIS project that were done. The interactive installations evaluation process gradually developed from usability aspects to more subjective issues like environmental awareness later on. From this process, we infer that these experiences contribute to a feeling of belonging, providing contact with nature and leading to social change through awareness on environmental issues – *for the design of a more sustainable environment*.

+info **http://artivis.net**



ACKNOWLEDGEMENTS This research is done in the framework of the PhD in Digital Media of the UT Austin-Portugal Program funded by FCT – Foundation for Science and Technology (ref. SFRH/BD/42555/2007). We also thank: Valentina Nisi for the collaboration in *Play with Fire* and AZ Labs and its members for the development support, especially to Pedro Ângelo who programmedthe interactive installations implemented; Victoria Vesna, for the research term at UCLA Art|Sci center+lab; the participants who returned the questionnaires in the evaluation phase of this research..

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MUSEUM OF RANSOM

UT Austin | Portugal
International Collaboratory for Emerging Technologies, CoLab

Faculty of Engineering of the University of Porto | **PhD in Digital Media**
Researcher: Daniel Brandão | **Advisor:** Heitor Alvelos |
Co-advisor: Patrícia Romeiro | **Colaboration:** Helena Borges

KEYWORDS
Participatory documenting | Open archive | Daily life videos | Museum of all

The **Museum of Ransom** is part of an ongoing investigation project and it is also our contribution to the discussion about a **new concept of museum**, built collectively, and which emerges from the proliferation of new tools for production and sharing content and from the further rooting of new media that many use to document fragments of their daily lives.

The video recording tools (from video cameras to mobile phones), the video manipulation and editing tools (from the professional software to the online and free one) and the video sharing tools (online platforms such as Youtube and Vimeo), are more and more accessible and people that use them are increasingly realizing its potentials as communication tools.

More and more people film their daily life scenes to save memories in moving images. But where are those recordings going to? We believe that they should be ransom, through mechanisms of aggregating information, catalogued, through digital processes and techniques of archiving and given back to the community of authors of those videos, through moments and systems of public presentation. And this is the role of this project that assumes the configuration of a museum of all. **Its mission is to collect, preserve, act and present always with the contribution from people**.

The Museum of Ransom aims at collecting videos of local daily life, made by anyone with more or less skills, using any kind of video equipment… even a mobile phone!

The main purpose is to gather stories, situations, family moments, street events, **everything that goes beyond the "official" narrative of our city**. People playing cards in the public gardens, kids playing at the main squares, the conversations in the windows, our grandmother's soup recipe, the dives in the river, the heated discussions on politics taken on local cafes or the willingness to change the world.

Despite the unpredictability in the type of content that this archive is receiving, **it is assumed the clear intention that it should reveal a genuine, spontaneous and natural cultural stirring**.

We will have a Lab in futureplaces 2012 where participants will contribute with their own documentation of the festival, which will then be made available for open editing.

Bring a video camera device, and be part of a different way of documenting local realities.

museudoresgate.org

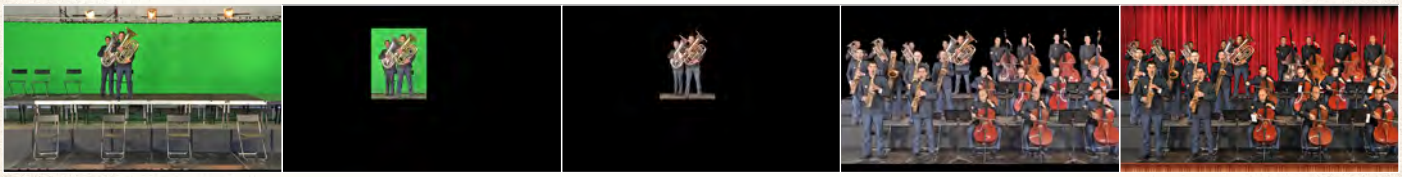
The project presented in this communication is being developed as part of the Ph.D. in Digital Media, of the Universidade do Porto and the Universidade Nova de Lisboa, with the support of UT Austin-Portugal program and supervised by Prof. Heitor Alvelos.

MULTILINEAR INTERACTIVE FILMS
using live action structured video

Project 1 E-maestro (concluded)

This first project is an attempt to recreate the musical experience of being in front of a symphony orchestra containing more than 80 members. The interaction between the audience and the orchestra is achieved through the development of an interactive software application enabling users to manipulate groups of musicians, truly putting the viewer in the role of the symphony orchestra conductor.
Is intended to investigate how to reconcile a multi-linear structure with the spatial distribution of the musicians. Each group of musicians is recorded individually and assigned a video layer. The video structure formed by all the layers forms the entire orchestra. By touching each button on the console, the user can make each group (layer) of musicians sit down to stop playing or stand up to resume their interpretation.

This project will allow us to test several technical facets:
i. video recording techniques capturing the individual musician performances in isolation from each other and from the background;
ii. spatial montage of individual performances in order to recover the appearance of the symphonic orchestra without revealing the overlapping layers technique;
iii. research the ability to control time/synchronization between video components;
iv. test software platforms controlling video layer interactivity.



Project 2 Location-aware multi-linear narratives (in pre-production)

This project aims to explore multi-linear narratives that unfold over several rooms. Seek the question of space montage more broadly. The content will not be limited to a projection screen or a fixed framework but distributed virtually throughout the rooms of a building.
This project uses an augmented reality application running on a mobile device (tablet) as the means of compiling micro-narratives dispersed throughout the rooms. Showing up on the screen, superimposed on the images captured by the camera device, is the recorded content accord to the various micro-narratives. The user thus explores the various stories spatially looking for them with the aid of the device-camera.

This second project aims to extend and deepen the investigation into multilinear interactive films:
i. creation of a multi-linear structure able to adapt the different pathways users choose from whilst retaining a general narrative consistency;
ii. usage of augmented reality and mobile devices in order to control the presentation of content depending on user location;
iii. to test the interface's ability to keep the user immersed in the audiovisual experience while maintaining all interactive possibilities.

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MµARTs
amplifying the inner - connecting selves

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Abstract

In this project, dance performance plays the central role of creating an interchangeable emotional experience shared by performers and audience. In order to deeply understand this shared process, we will explore a neurobiological basis of empathy and human syntonic experience, by amplifying real time brain activity in the frequency domain. Dance performance is the chosen path to trigger an emotional experience and to explore the attunement between personal experiences. Neurosciences are the chosen language to decode human experiencing in its very pureness.

State of art

The performer reflects rational intentions and actions along with emotional phenomena. These mental processes (reasoning and emoting) naturally become shared processes based upon interactivity between performers and audience. Giving that muscular action is intrinsically linked to emotion, movement itself is "the transparent vehicle of an inmost, pan-human emotional realm" (Foster, 2010, pp.158). "The body spontaneously maps the contours of the psyche, the pronouncement of its veracity a direct product of its connection to interiority." (Foster, 2010, pp.158). Scientifically, empathy is defined as the capacity to decode others' emotions, feelings, intentions and actions. Empathy is this entire "dynamism of the other being replicated within the observer's self" (pp.154), transforming and expanding each one's experience. Rizzolatti and Craighero (2005) were the first scientists suggesting that this capacity depends upon specific neurons – the so called mirror neurons. Within brain's communicating process, neurons are the entities who convey all messages through both chemical transmissions and electro magnetic oscillations, which have been being recorded in form of wave(s), i.e., sinusoids with frequency and amplitude Beyond being characterized by having different frequencies and amplitudes, brain waves are correlated with certain areas, brain processes and states of mind.

Objectives

a) Explore the power of visualizing brain frequency to decode and support different states of human syntonic experience;
b) Explore whether different performative scenarios lead to different relational atmospheres – translated by different brain waves synchrony states;
c) Identify what kind of scenario helps in creating a more intense syntonic experience; identify some possible main ingredients in this changeable relational process.

Hypothesis

We aim to explore whether performative art act creates empathy and, if so, whether it is a brain process or a state of mind – A correlation between the power of specific frequency bands of both performer and audience, in specific kinetic events and their evolution during the performance.

Methodology

Participants
1) Dancer—same performer, every trial—,
2) Subjects from the audiences—random choice, each trial.

Materials

Hardware / software:

- EMOTIV Epoc is BCI wireless and portable to record the brain electric potentials (EEG data);
- Mind WorkStation and/or OpenVibe to do signal processing and data analysis;
- sLORETA to do source location software.
- Canon 5D Mark II video camera and Final Cut Pro X video editor (i.e., every subject that are used on each recording) to document and the process
- Quartz Composer to create the audiovisual amplyfication background of the performance.
- (SPSS) Statistical Package for Social Sciences (by IBM), a specialized application for data mining and statistical analysis.

Procedure

A 3 minutes dance choreography created by an accredited choreographer will be segmented in kinetic events so that we can better understand the empathic process.
The choreography will be the same for 3 independent conditions. Each condition will correspond to a different phase of our procedure.

- First condition: a solo performance without audience (repeated for 40 Trials). We will analyze and study all the frequency bands (Delta, Theta, Alpha, SMS rhythm, Beta and Gama) power (Square Amplitude) and source location (Talairach coordinates) of the performer brain activity. All trials will be done in the same setting.

- Second condition: a solo performance with 1 audience subject (repeated for 40 Trials). The same as in the first condition will be done along with electromagnetic brain signal amplification into the color and music spectrum according to the power of the frequency band that a certain brain region is operating. All trials will be done in the same setting.

- Third condition: a solo performance with full audience (10/20 subjects) (repeated for 40 Trials). The same as in the first and second conditions will be done along with analyzing and studying all the frequency bands power and source location of both 3 audience subjects randomized. At the end of each performance, a behavioral instrument validation (Fascination Questionnaire) will be passed. As the setting will probably not be the same for all trials, we will also register exhaustively a full description of every setting.

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Online Journalism

cognitive neurosciences towards a new distribution model

Tiago Gama Rocha[1]

Abstract

As online journalism becomes a much larger part of journalism "life", a constant question is (or should be) whether and to what extent the context matters – whether the digital online experience itself impacts the effectiveness of news, and whether that experience is best accompanied by a different allocation (distribution) strategy. Nowadays, the real competition is for users attention – a better undertstanding of SMP users' news consumption behavior has become an urgent need. Some major questions arise: Do online users respond differently to news content when experiencing SMP with different mixes of personal engagement and relevance (e.g. social and, microblogging)? Should news contents be allocated differently in these online contexts? And if so, what is the best approach to optimize news engagement across different types of SMP? We will provide the first quantitative answer to these questions within the Portuguese news industry.

State of art

> "Journalists are teachers without the power to give their students grades. In fact, the class is in charge; the teacher is the one who has to pass the test" (Fuller, 2010a).

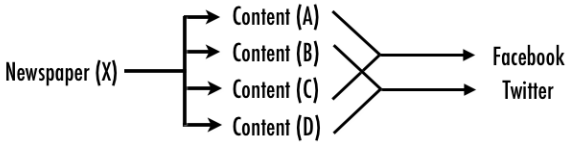
The Pew report on "Understanding the Participatory News Consumer" underlined an interesting statistic– half percent of social network users who also consume news online received their news from people they follow within social networks – leading the author to conclude that "news is becoming a shared experience as people exchange links and recommendations as a form of cultural currency in their social networks" (Purcell et. al. 2010, 40). In the 2009 Nieman Lab Report, Richard Gordon assessed how social media platforms created challenges to the news structure that had just started to embrace the social web. Other authors have talked about how journalism can make use of social media (Betancourt, 2009; Lowery, 2009) and how user behavior is changing news media (Greenshow & Reifman, 2009; Levy 2009; Li and Bernoff 2009; Ostrow 2009; Skoler 2009). Also, there are a number of articles that aim to provide a better understanding of how the use of social media in daily routines is transforming many aspects of the journalistic field: schools of journalism (Greenhow and Reifman 2009; Klose 2009), the role of the journalist (Gordon 2009; Jarvis 2011; Lavrusky 2009; Lewis 2009; Skoler 2009), the role of the user, (Holtz 2009; Jarvis 2011g; Picard 2009), the role of content (Jarvis 2011; Jarvis in King 2010), and the ethical challenges (Jarvis 2011; Leach 2009; Podger 2009). By considering the above mentioned literature we infer that the maxims of this evolution are that: 1) journalism is a process and not a product; 2) it must be more discursive and less declarative/controlled; and 3) its value relies on the relationship with its audience and subsequent data that emerges from it.

Fuller (2010b, 70) also points towards important aspects for the future of news: 1) do everything in order to "attract audiences attention" and 2) audiences "scanning for something that seems important enough to give attention to". The dimension of attention will then be our chosen path to understand what engages users the most. We will use neuroscientific methodologies to robustly operationalize the construct of attention.

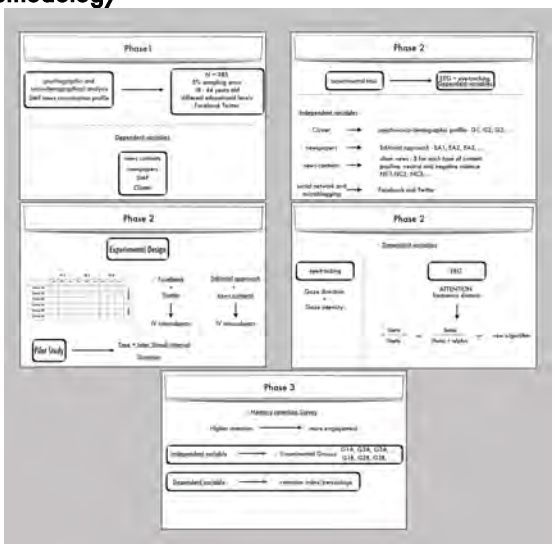
In the last decade we witnessed an exponential growth in the research concerning the estimation of mental states from patterns of electroencephalographic activity from the frequency-domain analysis. These include robust estimators of mental workload (for a review see Kamzanova et al. 2011) and affective tone (e.g. Coan and Allen 2003). Studying such mental states allows for online monitoring and estimation of the amount of attentional resources allocated at a particular moment. When combined with eye-tracking activity this permits the inference of the mental state of the subjects when allocating its gaze on a particular stimulus.

Objectives

1) A proposal for a new Distribution Model applyed to the information context;
2) A better understanding of how the context influences the users attention;
3) Outline a segmented distribution strategy, for the selected newspapers, based on the dimension of attention.



Methodology



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VIRTUAL MARIONETTE

INTERACTION MODEL FOR DIGITAL PUPPETRY

Virtual Marionette brings the art of puppetry into digital animation.
Inspired by the traditional puppetry methods, we seek new ways to interact with computer performing objects in real-time using digital interfaces.

Be creative, and bring life to inanimate figures in imaginative way. With Virtual Marionette, you are the puppeteer, and Puppets turn into live animated characters that take part in your story.

By rigging objects and mapping them to input interfaces, artists and non-expert users are able to manipulate and animate puppets in a collaborative and intuitive manner bringing improvisation to the play.

The goal of this thesis is to research and deploy methods and techniques for the manipulation of articulated puppets in real-time and develop an interaction model for digital puppetry.

PUPPIT

PLAY WITH VIRTUAL PUPPETS

this work in progress is a set of tools and applications that promotes digital puppetry in different environments, exploring interaction, rigging, mapping and animation methods.

Everybody can play with PUPPIT and bring a story into real life.





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Parameterized Shading Methodology for Animation of Facial Expressions

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Abstract

Skin is the most visible organ of the human body and, among other factors, plays an important role as non verbal communication when expressing emotions [1]. Most of the current skin shading techniques are static models: they look physically correct but do not take into account skin color variations as a consequence of computationally expensive techniques and time consuming animation. Facial skin color is often rendered as any other skin from the body and we all empirically see how facial skin changes appearance as we express emotions like fear or happiness. We propose a parameterized methodology for painting skin color textures according to the six basic emotions plus after a subject has performed physical exercise. The methodology is planned as a tool for the use of artists and animators to allow the customization of facial textures for any character style.

Goal

Despite the fact that facial skin representation is different and unique for each character, we can still find patterns for representation of emotions: everyone recognizes emotions such as an ashamed blush or a pale fear no matter the character features or its art style. Currently, skin color animation requires that all textures for portraying expressions to be hand painted empirically by artists, being a labor intensive process made without guidelines. It may take up an estimated time of an additional 30 hours for an experienced digital artist create all the needed textures for the animation of the six basic facial emotions of a 3D character [3]. Our methodology objective is to provide artists and animators accurate guidelines to paint coherent set of facial textures for synthetic characters when physical or emotional changes occur. These guidelines mean the definition of color hue, saturation and facial area distribution of blushing.

Method

We focused our methodology on the six basic universal emotions (surprise, fear, disgust, anger, happiness and sadness), as defined by Ekman, and by blending these six emotions we can obtain many other expressions. After exercise expression was added as it is a recurrent action used in animation. The methodology gallery study is supported by scientific and artistic data empirical comparison: melanin (image 1.b) and hemoglobin (image 1.c) SIAscope maps [4] that accurately characterize human skin color, and painted portraits of different authors and styles, as an example of artistic expression and visual perception (the third ring of images). Image (1.a) represents the vascular patterns of the face [5] and image (1.c) allow us to empirically determine the facial areas where blood vascularization is higher and will be more likely to color change.

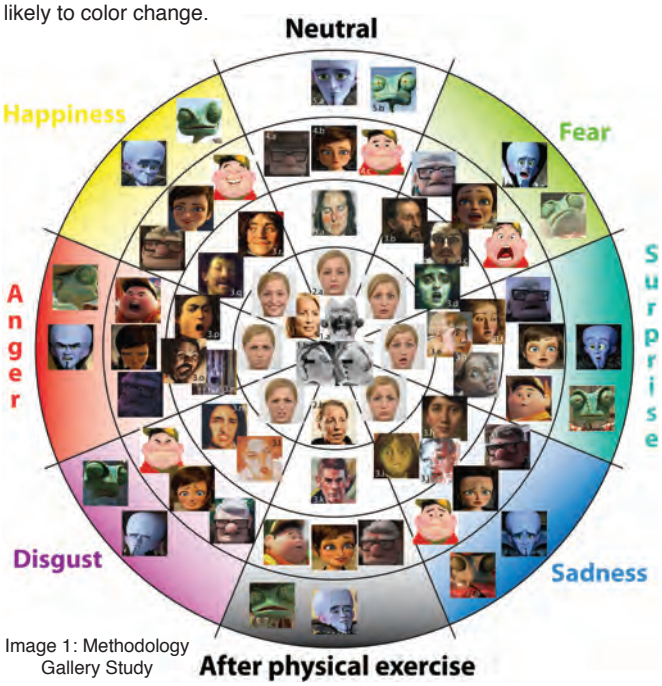

Image 1: Methodology Gallery Study

Melanin concentration (image 1.b) is unique for everyone and changes over time; it is useful to help an artist determine a character's skin base tone, as an example, for creating the epidermal texture of a 3D character [6]. The second ring of images gathers a Caucasian skin type human subjects representing the six basic universal emotions [7] plus after exercise, providing examples of natural skin color appearance when expressing emotions. As we move towards the outer parts of the circle, characters depict increasingly varying styles and skin colors. The fourth ring of images represents animated cartoons, created recently in the entertainment industry, being an important target and reference. The fifth ring gathers fantasy creatures with non-conventional skin colors and textures. The color concept chosen was adapted from Plutchik's circumplex model to describe the relation among emotions and color in terms of their characteristics (intensity, hue and complementarity) [8]. Color intensifies as it moves towards the circle outside to follow character style and skin color growing variation.

Conclusions

Our final goal is to improve the character's expressions believability, which does not mean pure realism as Pixar describes, it means to depart from realism in order to appear lifelike and connect with the audience. It means that all technical effort (the realm of science) is subject to creative control (the realm of art) [10]. So each character will have their emotions portrayed accordingly adapted to its art style (either it is a cartoon, human like or fantasy creature) and following what looks best to our visual perception. More expressive and lifelike characters can increase the user's immersion in film or videogames because their skin reflects blood perfusion patterns and the viewer's visual perception expectations.

Acknowledgements

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Image 1 (Methodology Gallery Study): 1.a – [4]; 1.b and 1.c – [3]; 2.a – [6]; 2.b – Sacha Goldberger: Before and after pictures of joggers, 2010; 3.a – Lucian Freud, Woman with eyes closed, 2002; 3.b – Ilya Repin, Study for the picture Ivan, 1883; 3.c – Gustave Courbet, The desperate man, 1844; 3.d – Laura Dreyfus Barney, Medusa, 1892; 3.e – Ferdinand Hodler, Surprised by the storm, 1887; 3.f – Peter Paul Rubens, Susanna and the elders, 1609; 3.g - Michelangelo Buonarroti, Sistine Chapel fresco, ignudi detail, 1509; 3.h – Alice Pyke Barney, Agnes, 1903; 3.i – Edvard Munch, Anxiety, 1894; 3.j – Jenny Saville; 3.k – Kristina Laurendi Havens, 2011; 3.l – Egon Schiele, Scornful woman, 1910; 3.m – Pamela Davis Kivelson, Disgust, 2008; 3.n – Francis Bacon, Study after Velazquez portrait of Innocent X, 1953; 3.o – Jose de Ribera, Apollo flaying Marsyas, 1637; 3.p – Caravaggio, Testa di Medusa, 1598-1599; 3.q – Rembrandt van Rijn, Bust of a laughing man in a gorget, 1630; 3.r - Rans Hals Buffoon, Playing a lute, 1624; 4.a and 4.c – Walt Disney and Pixar, Up, 2009; 4.b and 5.a – Dreamworks, Megamind, 2010; 5.b – Blind Wink Productions, Rango, 2011.

"Buzz" about Science

how can Guerrila Marketing and Social Media improve the Public Engagement in Science?

During the last decades, scientists have been aiming to disseminate science to the public at large. This objective has been the engine for many initiatives that range from science museums to scientific or news pages in newspapers, through the TV and, more recently, making use of digital media, specially the Internet. These initiatives seek to foster a dynamic and participatory role from the society in general, promoting a collective scientific awareness.

But both evidences and studies conclude that the existence of scientific content available to the lay public does not mean that those access them. It's therefore necessary to be found and analyzed new approaches to communicate science to the general public. This project aims at validating the Guerrilla Marketing approach, in a broad definition and based on the New Media concepts and possibilities, as a promoter of a wider social interest in science and its dissemination. If this form of communication and promotion has been shown to be positive for business and organizational environments, it's important to understand in which paradigms it can be used in the promotion and communication of science.

Science communication, Guerrilla Marketing, Social Media, New-Media, Science Marketing.

Paulo J. Fontes (paulo.fontes@fe.up.pt) | Advisor: Professor José M. P. Azevedo, PhD | Digital Media Doctoral Program | FEUP | 2012

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LIBRARY NETWORK

Integrated Communication in the Context of Participatory Culture

:: ABSTRACT

We aim to contribute to possible solutions that best meet the needs and expectations of users of Portuguese public libraries, through the use of digital media of participatory nature currently available. The study will be based in a reassessment of the approaches of these libraries to the community in the internet.

The contribution of the present Ph.D. study will complement a wider scope of projects and will address specific aspects of this wider problem. These aspects to be selected as subject of the present study will reveal themselves through the current ongoing field work. They may include one or more of the following: reading networks, online access to manuscripts, share of reviews and ratings, events organized by citizens, among others.

An inventory of contacts with Portuguese public libraries has been established, and is fully operational. Given the geographical proximity and the ongoing interviews it seems likely that the Municipal Public Library of Oporto will become the specific case study of the present project. It is our intention that this particular case study will review a serious of issues that may in due time be applicable to further contacts.

:: PROBLEM DEFINITION

In the last decades we have witnessed the emergence of a range of new media and new technologies that have altered human habits and behaviours, leading to rethink the communicative approaches of the institutions to their public. This new social paradigm led to profound changes in the searching habits of society, motivated mainly by the development and expansion of the internet and especially by the proliferation of information in this media. The fast and easy access to information from anywhere with internet and the emergence of projects like Google Book Project, which already has millions of digitized books, frequently leads to the wrong notion that everything is available at any time. The libraries are often becoming less frequented spaces by the society since the role of these institutions as "gateways" of information is being shared with other sources (Dunn & Menchaca, 2009). And though these sources may be of variable quality and not guaranteed, they are of easier and faster access becoming more attractive, particularly for the younger generations, or the so-called Net Generation, characterized as the generation of the here and now (Chaves et al., 2007), and focused on instant sources, of simple use and immediate response such as Google (Agosto et al., 2011; Dunn & Menchaca, 2009).

Though we face these profound cultural and technological changes, it appears that Portuguese public libraries do not harness the potential of the internet as an interactive medium. This finding is based on an initial observation of the web presences of public libraries from the municipalities of Portugal, which allows us to conclude that the use of web platforms are generally reduced, particularly with regard to social networks and social media. In a study conducted to a universe of 277 public libraries, we realized that 191 don't have their own website and the percentage of institutions that work with social networks and/or social media, such as Facebook, Blog, Twitter, Youtube, Flickr or Delicious, does not reach 25%. The forms of interaction with the user also proved to be limited in these platforms. Being the public libraries true repositories of literature and documentary memories of human history, they may represent a strong contribution to the intellectual development of society, therefore requiring a greater community engagement and a better framing in relation to its cultural and technological developments. In this sense, we understand that the increased efficiency of these institutions requires a reformulation of their approaches to the public in the web space to better fit a new social paradigm characterized by participatory and collaborative practices and technologies.

:: RESEARCH QUESTIONS

_ Which factors should be considered in the development of a web platform for a Portuguese public library that values the usability and communicability, and may result in a significant improvement of the services of the institution?
_ What features in a web platform of a Portuguese public library are most valued by its users?
_ Which systems of participatory and collaborative nature, liable to extra-institutional implementation, may result in increased user satisfaction and in a more frequent use of the services of the institution?

:: AIMS & OBJECTIVES

It is intended to highlight the importance of using web 2.0 tools in the web platforms of Portuguese public libraries to establish a closer and continued communication with their users and to increase the efficiency of services provided.

Though it's our purpose to focus this study on Municipal Public Library of Oporto it is our intention that this particular case study will review a serious of issues that may in due time be applicable to further contacts. It's our goal to identify a set of tools and methodologies that may be adopted in web platforms of Portuguese public libraries, aiming the optimization of their services, to establish a closer relationship with their users and greater engagement with the community, and a more personalized response to the different audiences they can serve.

:: METHODOLOGY

_ Analysis of the approaches of foreign public libraries in the web platforms. How these institutions use web 2.0 tools to improve their communication with users and their services.
_ Analysis of the approaches of portuguese public libraries in the context of web.
_ Development of a field study involving librarians and users for a better social and geographical contextualization.
_ Proposal of a set of tools to incorporate into the web platforms of portuguese public libraries that allows to foster forms of communication between them and their public to optimize their services and increase user satisfaction.

:: EXPECTED OUTCOMES

_ A set of recommendations of methodologies and technologies that can be applied in the web platforms of Portuguese Public Libraries
_ The development of a manual of implementation of these methodologies and technologies so that the staff of these institutions may have the knowledge and the results acquired during this investigation
_ A significant contribution to the development of the communication of Portuguese Public Libraries in the web and a contribution for the improvement of their services

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INVITE
SOCIAL IDENTITY AND PARTNERSHIP IN VIRTUAL ENVIRONMENTS

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Who?

INVITE is a research project on the themes of multimedia, artificial intelligence and games. The main topic explored is the development of artificial intelligence mechanisms to create artificial players that can perform well in complex social situations.

Why?

Believability

In complex social situations such social dilemmas, agents should be **socially aware** and behave accordingly to their social context. In their decisions, agents should have in consideration their group **memberships** while **balancing out** their own **rational behaviour**. In order to do that, they need to **anticipate others**.

What?

Social Identity

The perception of **membership** influences the agent's behaviour leading to **social bias** in **decision-making**. There is the tendency to **favour** others with **similar identities** and **blame** others with **different identities**, having an impact on team's commitment.

Rationality

In **conflict scenarios**, agents should act rationally, trying to **maximize** their expected **utility** according to their individual and social preferences. However this sometimes leads to **different decisions** than **social bias**. There should be a **balance** between both.

How?

Anticipation

Being able to anticipate allows agents to **predict future world states**, and establish beliefs about other agent's personality, intentions, plans and strategies. This will help in their decisions, allowing agents to **adapt their own behaviour** and cope better with the social situation.

www.project-invite.eu

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LEARNING FACIAL EMOTIONS USING SERIOUS GAMES

LIFEisGAME

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Jake Aggarwal [UTA], Cristina Queirós [FPCE-UP] and António Marques [IPP]

17/10/2012

This project attempts to show how it is possible to apply a pioneer serious game approach to teach people with emotional disorders to recognize facial emotions

Technology

Deploys a low cost real time facial animation system embedded in an experimental game, which will allow to further study the symptomatic problems of facial emotion recognition. LIFEisGAME advances the synthesis of realistic virtual characters and markerless motion capture technology, and creates a non-stressful game to help individuals recognize facial emotions in an interactive way.

Helps children with Autism Spectrum Disorder improve their communication skills in a fun way without inducing stress using virtual character synthesis and real-time facial expression anaysis

Application

Focuses on an open question of scientific and clinical importance, of whether the use of virtual character in interactive training programs can provide basis for Austism Spectrum Disorder rehabilitaion.

This will have a relevant impact in: *Psychology* by studying novel interactive approaches using avatars in virtual environments to improve personal interactions; *Entertainment Industry*: movies, games and new media and *Academia* by advancing the state of the art in related research fields.

| www.portointeractivecenter.org |