

# An interactive device for exploring thematically sorted artworks

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**Abstract.** This Mediadrom artful post-TV scenario consists in sketching the user interface of an interactive media content browsing system for exploring thematically sorted artworks, from the art field of plastic theater, merging art pieces at the intersection of the visual and the performing arts. Combining a touchscreen and an hypermedia browser of image and video content with expert annotations, this system can be installed in venues such as museum and media libraries, and performance spaces as satellite installation to plastic theater performances.

**Keywords:** hypermedia browser, multimedia annotation, interactive installation, plastic theater

## 1 Introduction, artistic intention

This paper focuses on the work of the Baltazars<sup>1</sup>, a duo of artists producing art forms between the performing and the visual arts. This artform, coined “plastic theater” [14], after Tennessee Williams’ first usage of the term [7], uses the materials of the visual arts (named “arts plastiques” in French) in the context in performing arts. In concrete terms, their work is often presented in theaters, while no human figure is present on stage, nor any text visible or audible. Thus the spectators perception can be focused on the movements and variations of sensory materials such as light, sound, smoke, air movements, etc. All these materials are carefully arranged in time, in order to create a dramaturgy of matter, that brings the nature of this work, from the realm of the visual arts, towards those of the performing arts.

Our aim in this project is to design a collection management system that could be browsed both through a touch screen in venues such as festivals, media libraries and museums; but as well on a website, with standard keyboards and mice, or other peripherals left to the discretion of the remote visitors.

As any other artwork, the experience of this work benefits from being mediated to the audience, after or before the actual experience of the work itself.

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<sup>1</sup> Image and video samples are available on <https://www.facebook.com/TheBaltazars>.

Furthermore, the fact that this work drifts apart from the mainstream artistic production makes this need for mediation even stronger. In addition to implying human mediating agents, the current proposal would allow a more action-oriented and proactive mediation, based on the spectators needs, desires and curiosity.

The device proposed here could then, on the one hand prepare the spectator to the experience of the actual work, e.g. by clearing some a-priori about such a non-narrative/non-figurative type of work, by showing that similar works already existed for quite a long time, for some of them. On the other hand, the device would also allow him to go further the actual experience, by leading his own curiosity along the exploration, and hopefully helping him discovering some works and artists he had not heard of..

The content of the exploration would then be composed of such elements as a set of works by other artists, references to techniques and artistic materials, natural phenomena, etc. All of these would be selected for their connection to the work and statement of the Baltazars, as the purpose of this device is not a general introduction to art, but is rather intended to focus and relate to this specific work. In other words, the corpus of works presented here are done so along a certain artistic perspective.

## 2 Context, similar works

Paul Otlet (1868-1944), the founder of Mundaneum<sup>2</sup>, a paper-based ancestry of Google, among other notable achievements, wrote two treaties on how to classify knowledge, *Traité de Documentation* (1934) and *Monde: Essai d'universalisme* (1935), long before nowadays online search engines. He theorized a whole workflow on documentation, including: the Universal Decimal Classification, and 35-inch cards to label items in catalogs. What could be written on such cards? Here follow examples of criteria used for the organization of media data:

- metadata usually provides factual data on media items, which can be generic such as: author, title, album or collection, location or geographical origin, often the date of creation or publication; or specific to the media collection;
- semantic data, such as tags, add subjectivity to media elements, and can often be organized into ontologies, which provide a relational structure to data that cant be classified into mutually-exclusive categories;
- by means of computer analysis and signal processing, content-based criteria are extracted from the data and stand as objective numeric data; from low-level criteria close to the signal properties as evocative as the algorithm designed to output these can be, to higher level including perceptual criteria adapted to the human perception: mean color or shape for images, motion orientation for videos, energy or loudness in audio.

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<sup>2</sup> <http://www.mundaneum.be>

In [4], some of the authors evaluate how scientific works on multimedia information retrieval, particularly content-based similarity, can foster new practices in digital or new media arts. One artist and scientist that has been using such technologies as a theme for his artistic works is George Legrady<sup>3</sup>, notably since *Pockets Full of Memories* (2001-2007), an installation where participants can scan everyday objects which are then virtually organized in a projected Kohonen self-organizing map, based on the textual description inputted by the visitors. This installation is described in the book *Database Aesthetics*, edited by Victoria Vesna, among other similar works [15]. In an other artistic field, American choreographer Bud Blumenthals project *Dancers!* proposes an online interactive website for browsing and comparing improvised recordings of dancers<sup>4</sup>, developed in collaboration with scientists from the field of multimedia information retrieval [13]. The recent works of Lev Manovich combining information retrieval and media arts are labeled “cultural analytics” [8,9].

### 3 Description of the scenario

#### 3.1 Context and setup

At venues such as festivals, theatres or media libraries, where some works of the Baltazars are possibly presented, a room is dedicated to the device described in this article. The room is darkened, there is a couch in the middle of it, facing a coffee table on which a touch screen is laid down, and a projection screen on the wall, with a pair of loudspeakers.

#### 3.2 Interactive content exploration

When a visitor sits down and first looks at the touch screen, he sees the interface presented in Figure 1. At this first stage, the visitor is able to read a general presentation of the Baltazars’ work, in which several keywords are marked in color, and will act as hyperlinks when tapped, as we will explain below. Clouds of thumbnails are floating around the central text-based block. Each of the thumbnails will reconfigure the screen of the application as described in the next figures. The bigger thumbnails are links to works from the Baltazars.

The visitor can then tap on:

- the Baltazars’ works (bringing him to the screen described in Figure 2),
- any other items (leading to other artists’ works as shown in Figure 3),
- the colored words, linking to the related themes (as presented in Figure 4)

Lets assume that the visitor taps on the *Nocturnes* thumbnail on the left side. The main block would then get smaller, go to the bottom of the page, and fill with some new content, as described in Figure 2. The floating thumbnails would then also smoothly re-arrange, disappearing for some of them, and letting other come on the front stage.

<sup>3</sup> <http://www.georgelegrady.com>

<sup>4</sup> <http://www.dancersproject.com/interactive/>

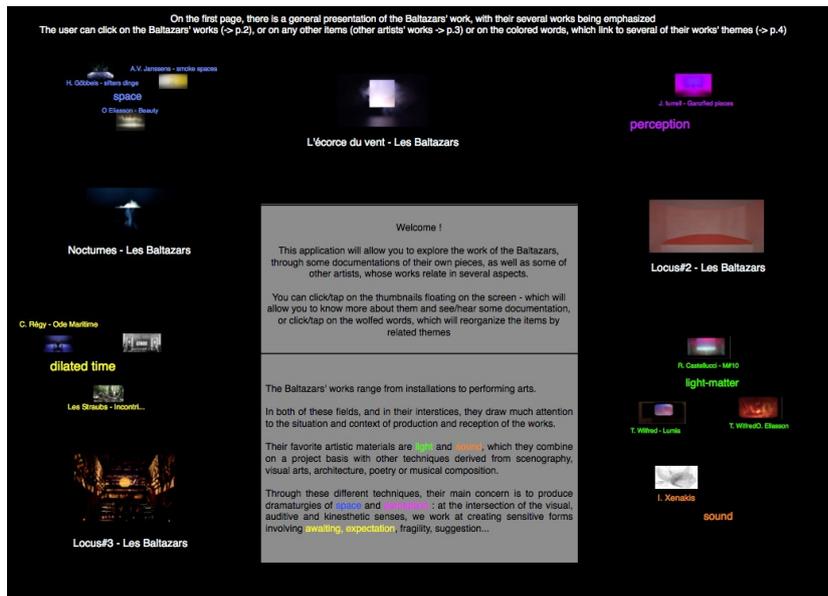


Fig. 1. The welcome screen of the application

The visitor would then be presented a short explanation of the main features of the work, and a more specific description of the particular sequence that is available by tapping on the central image (with the play button). This action would then trigger the projection (on the projection screen) of this sequence: a video documentation or a diorama of the presented work. In the body of the text - just like in the “welcome screen” - some words are colored. These are the main themes of this work and specific sequence. The elements related to these themes are displayed as clouds, arranged by theme and color around the central block. On the bottom of the main block, a space is devoted to a collection of specific hyperlinks that may allow the user to go further the short presentations by consulting online articles, websites, etc. Once the visitor is done with consulting this particular sequence or work, he can tap on another thumbnail, which will bring this very element to the center. Lets say that they tap on the top-right thumbnail, linking to Heiner Göbbels piece called *Stifters Dinge*. Thats exactly what Figure 3 describes thereafter.

The content of the main block has now been changed to fit Heiner Göbbels work, by following the same principles and design than in Figure 2. New thumbnails are now displayed and re-arranged in relation to the theme of the newly selected element (some of which being common with the previous element). If a lot of elements relate to the chosen, the most related ones will be displayed in a bigger size (with their titles), then less related being displayed as a cloud of micro-thumbnails... If the user wants to check something in the previous work, that brought him there, he can always go back to its previous choice by clicking

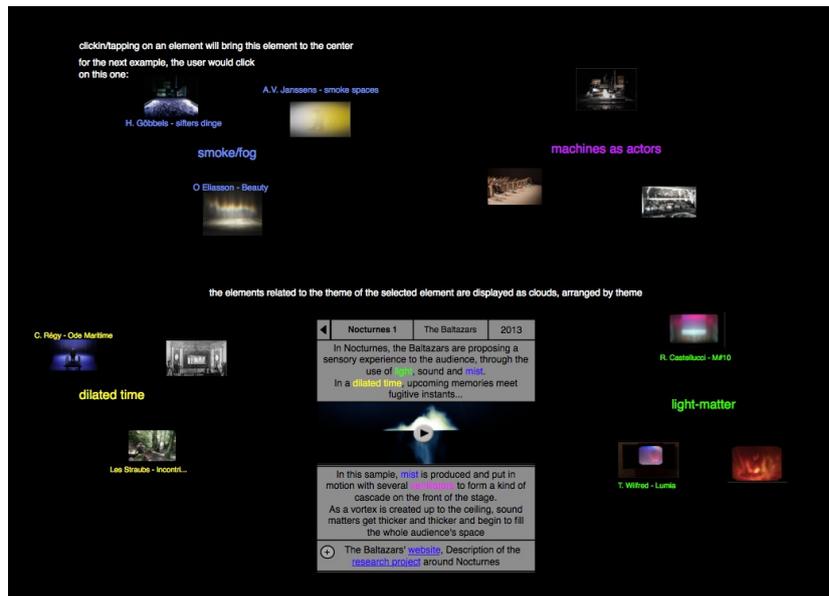


Fig. 2. Focusing on a specific work from the Baltazars (*Nocturnes*).

on the arrow on the top left corner. If he is particularly interested in one of the themes of the selected work, he could learn more about it, either by clicking on the colored word in the text, or in the middle of one of the clouds. Lets consider our visitor is interested by the concept of using machines as actors , this would bring him to the state described in Figure 4.

On the side of the main block, a kind of drawer will then swipe out, and display some specific information about the chosen theme. The visitor can now read on this new block a description of what this theme is, of which other artists are exploring it, and so on... Just like in the left part of the block, some words are colored and allow the visitor to further refine his exploration of this theme. In order to help focusing on this specific theme, only the elements related to this theme (here machines as actors) remain displayed on the screen, leaving more space for other works that were hidden away when considering all themes related to the work. Further refinement might be possible, e.g. by tapping on the date field, all related elements could be sorted by date, as in a kind of timeline, as shown in Figure 5. A line (or a triangle in the case of works spanned on a long period of time) would then help positioning this specific in comparison to the other presented works.

Other types of sorting could be devised, as the research progresses, in order to enrich even more the users experience and the possible interconnections between works and artists statements... Once the visitor goes away, the system goes back to the welcome screen described in Figure 1 and the whole process starts over again.

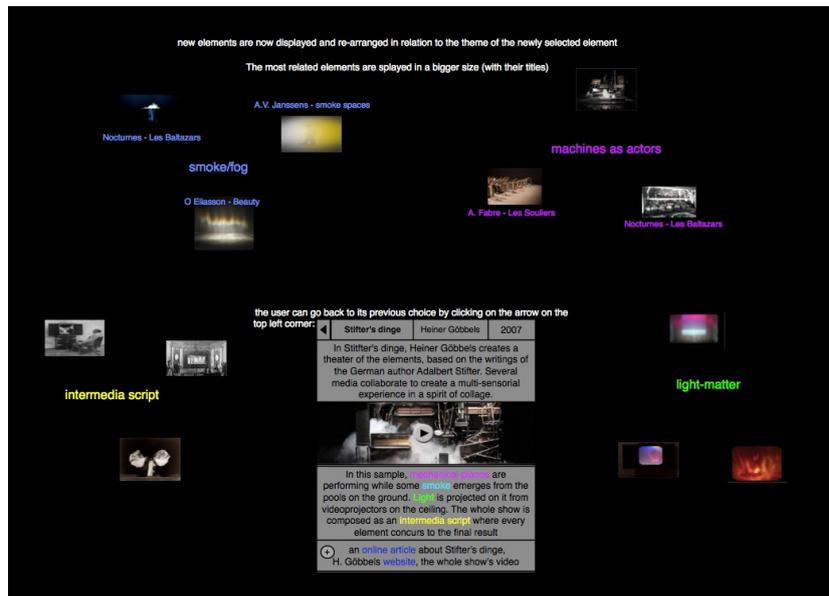


Fig. 3. Getting to know more about Heiner Göbble's work.

If possible, an online version and or a tablet/TV version of the system could be made available.

## 4 Analysis of technologies that would help to realize the scenario

### 4.1 Interfaces and presentation engines

Grafton, A., and Rosenberg, D. provide an in-depth overview of visualizations and maps of events with a strong emphasis on time in the graphical representation [5].

The works from La Médiathèque de la Communauté Française de Belgique are recent local examples from the two last years: two projects taking form of an online website and booth installed at media libraries. *Archipel*<sup>5</sup> proposes pathways to understand “unclassifiable” music from the last century, and *Beat Bang*<sup>6</sup> sorts representative albums of electronic music from 1988 to 2012 on a timeline against their average beat-per-minute (BPM). These illustrate that time is one parameter among others to organize and present data: the following section proposes an overview of other means.

<sup>5</sup> <http://www.archipels.be>

<sup>6</sup> <http://www.beatbang.be>

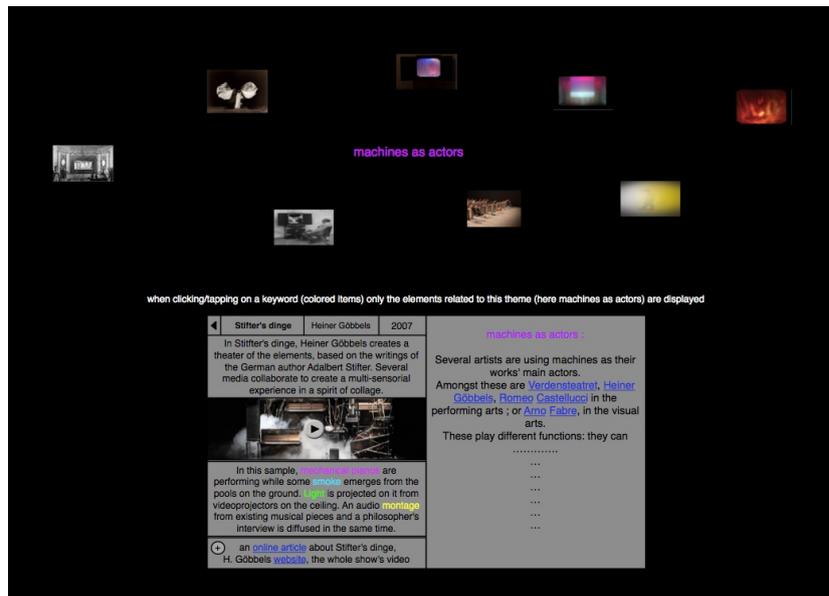


Fig. 4. Exploring a specific theme.

## 4.2 Intelligent hypervideo analysis

In our case, analysis and tagging would be done manually by a team of scholars from the domains of art history, performing arts or cinema studies. Considering the complexity of the classification proposed there is currently no automatic system to our knowledge that fulfils this task and that is available for download open-endedly.

There are promising works undertaken that could be combined so as to benefit from machine-based media analysis and human-contributed annotations. For instance Diogo Cabrals doctorate studies including the *TKB/Creation-Tool*<sup>7</sup> for the realtime annotation of dancers recordings [12] could be coupled with content-based analysis of such recordings [13] so as to benefit from both sides, human and machine, of semi-automated analysis. Alternative tools for intra-media audiovisual annotation that focus on the user experience are *ChronoViz*<sup>8</sup> [2] and *VCode/VData*<sup>9</sup> [6]. Some authors of this paper have been using these for side projects after a summer school workshop project aiming at comparing and evaluating such tools [3]. Both require Mac OSX, we might base our annotation tool upon these.

While plastic theater may involve scenes with danced movements, as it combines performances and plastic art forms, these aren't its primary trademark.

<sup>7</sup> <http://tkb.fcsh.unl.pt>

<sup>8</sup> <http://chronoviz.com>

<sup>9</sup> <https://code.google.com/p/vcode/>

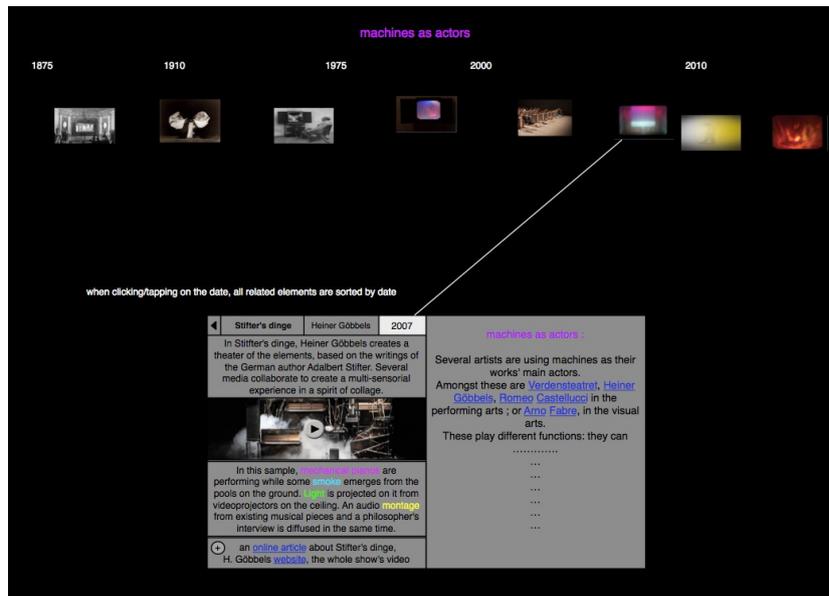


Fig. 5. Exploring a specific theme as a timeline.

More major features are behaving similarly to natural phenomena, such as sceneries and entities involving matters and textures put to life by nature: the sea, tornadoes, flows, and so on. Vezzani et al propose a solution for smoke detection in surveillance videos by combining user-driven annotations, a built-in ontology and a content-based system, MediaMill, also allowing to detect objects from the scene and people [16]. Another paper from the same authors, Calderara et al. [1], describe the algorithm more into-depth.

### 4.3 Linking hypervideo to web content

For each item of the media collection, a space in the bottom of the presentation will be dedicated to link online web content, as illustrated previously in the scenarios. Our goal is to gather experts from the various fields of performing arts and have them generate a corpus of analyses, concepts.

Richard Rinehart proposed an approach for the conceptualization of digital and media arts in [11], including a declarative model, a metadata framework, a notation system and ontology for these practices. To our knowledge, two ongoing international projects aim at preserving cultural heritage of non-mainstream art genres: e-clap<sup>10</sup> and i-Treasures<sup>11</sup>.

<sup>10</sup> <http://www.eclap.eu>

<sup>11</sup> <http://www.i-treasures.eu>

#### 4.4 Contextualisation and personalisation

During the evaluation phases and cycles of the interface, we may use attention-based algorithms so as to determine the points of interest of the visual user interface so as to improve its layout, as usability experts do by analyzing heatmaps computed from the pointer displacements. For that purpose we may use Nicolas Riche and Matei Mancias realtime computer vision algorithms for the automatic detection of salient events, inspired by human cognition and perception [10]. For inter-body-sized evaluation, a ceiling camera with wide-angle or fisheye lens may be used. For intra-body sized evaluation, a front depth-sensing camera such as the Microsoft Kinect or Asus Xtion may be used.

### 5 Sources of web and media content and their related copyright/copyleft issues

We plan two versions with different media collections, one being a subset of the other:

- a lighter copyright-friendly, mostly presenting pictures and images
- a denser version with video extracts, presented in media libraries, who are content providers

The video extracts of the denser version would be used for offline content-based analysis, and would still enhance the organization of media content of the lighter version through features extracted from these videos. We will investigate whether there is content appropriate to our scope in the e-clap database, mentioned in the previous subsection on hypermedia linking.

## 6 Conclusion

This paper presents a scenario and sketches of the desired user interface that will allow to create an interactive browser of art works related to the plastic theater genre. We plan to adapt an existing opensource multimodal annotation tool to allow experts from this genre to provide their insight on a collection of media fragments related to this genre. If we can get support from multimedia information retrieval and knowledge management scientists, it would be of help to improve the data organization of our browser. We plan to have this browser installed at venues such as media libraries (for instance La Médiathèque from Belgium), theaters where other works from Les Baltazars will be performed. We hope that such a project will be featured and presented during events related to Mons 2015 EU Capital of Culture.

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<sup>12</sup> <http://www.experiences-interactives.com>

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