

The Forking Paths revisited: experimenting on interactive film

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ABSTRACT

Based on the triad film-interactivity-experimentation, the applied research project *The Forking Paths*, developed at the Centre for Research in Arts and Communication (CIAC), endeavours to find alternative narrative forms in the field of Cinema and, more specifically, in the subfield of Interactive Cinema. The films in the project *The Forking Paths* invest in the interconnectivity between the film narrative and the viewer, who is given the possibility to be more active and engaged. At same time, the films undertake a research on the development of audio-visual language. The project is available at an online platform, which aims to foster the creation and web hosting of other Interactive Cinema projects in its different variables. This article focusses on the three films completed up to the moment: *Haze*, *The Book of the Dead*, and *Waltz*.

Keywords: Experimentation, Cinema, Interactivity, Time, Narrative, Platform, Digital Art

1. INTRODUCTION

The Forking Paths project began in January 2013 and is available at an online platform (oscaminhosquesebifurcam.ciac.pt) dedicated to interactive film experiences. In addition to other productions, all the films included in the project can be found at the platform: *Waltz* (2016), *The Book of the Dead* (2015) and *Haze* (2014). Seeking to align applied research with experimental development, this project comprised the following purposes at an early stage: the production of interactive film narratives that aim to take the viewer from an extradiegetic level to an intradiegetic level through a process of immersion; the reflection and the experimentation on the concept of time in cinema; the creation of a platform for hosting films and interactive film projects.

This chapter begins with a visit to the most significant moments in the history of interactive cinema, both at a purely technological level and at an aesthetic level, which is the result of a balanced combination between creative content and technology. Then, the central issue of this project, time in cinema, is developed, relating it to the theme and form of the tales chosen for adaptation. The methodology used and the interactive films produced or invited within the scope of the project will also be given special attention. Finally, the platform, the virtual place to where all content related to the project (from news to scientific articles) converges, will also be analysed in this article.

2. INTERACTIVE CINEMA

Several filmmakers and artists have ventured upon film productions which rely on multiple narratives, such as *Glimpses of the USA*, a 1959 film by Charles and Ray Eames (*Glimpses of the USA*, 1959).

This film consists of seven images projected simultaneously, giving the viewer the

freedom to combine the images as he/she so chooses. Multiple narratives usually consist of several closed narratives and use multiple events that may intersect and complement each other, giving meaning to the story as a whole. These characteristics bear some resemblance to the aesthetics of hypertext on the internet.

Back in 1927, film director Abel Gance released *Napoleon*, an epic film with multiple projection on three adjacent screens, building an enormous triptych, a technique which became known as Polyvision. Filming with three cameras, Gance intended to create widescreen panoramas and, in this way, enhance realism (see picture 2.17). While editing, Gance realized that the use of different images, side by side, had as great an impact as the panoramas, and, for that reason, he ended up using both the widescreen panoramas and the tryptich montages in the film *Napoleon*. The initial intention of achieving an increase in realism eventually led to an increase in abstraction.

In 1961, the horror film *Mr. Sardonicus* was realeased in movie theatres. Near the end of the film, there was a poll to punish the bad guy (Mr. Sardonicus, 1961). Using glow-in-the-dark cards, the audience would choose if this character would die at the end of the film. Luckily, the audience always voted for Sardonicus's death, as producer William Castle never shot the scene where Sardonicus did not die (Waters, 2007).

The first interactive film narrative installed in a custom-built projection room was released in 1967: the *Kinoautomat: One man and his House* by the Czech filmmaker Radúz Činčera (Kinoautomat, 1967).

The movie stopped at certain points to give the audience the possibility to interact with the narrative, using buttons installed on their seats. Given the two options, the audience voted by pressing one of the buttons, either red or green, and, according to their choice, the most voted option would dictate the scene to be played. Seeing that the possibility of choice given to the audience resulted in a certain form of empowerment regarding the unfolding of the narrative made this film a success at the International and Universal Exhibition held in the city of Montreal, Canada.

In the 80s and 90s, an interactive program called *Agora Escolha* [*Now You Choose*] was broadcasted on Portuguese television. The audience was given the opportunity to

choose the program to be broadcast at a certain time, between two possible options, through real-time voting and by telephone. There was a similar program in Brazil broadcasted by Rede Globo, in the 90s, named *Você decide* [*You Decide*]. The difference lay in the fact that, instead of having two different programs to choose from, this one allowed to choose between two different endings for the same program.

In 1991, two German television stations (ARD and ZDF) produced *Mörderische Entscheidung* [*A Murderous Decision*], directed by Oliver Hirschbiegel, a film that presents two versions simultaneously: one from the perspective of a woman, the other from that of a man. The films intersect in some scenes in which both the woman and the man perform together. The audience follows both perspectives by zapping in a story where neither the Aristotelian unity of space and time nor the narration can be altered.

In 1992, the cinema company Interfilm, in joint partnership with Sony, began conducting interactive cinema experiments, but, due to their very limited forms, they did not receive due attention for pioneering cinema interactivity. According to Lunenfeld (2005), one of the first to claim the title of interactive film (there were several who claimed this title) was Bob Bejan, in 1992, with *I'm your man* (Graham & Bejan, 1992). In this film, the audience used a seat-mounted joystick to vote between three narrative options, at six different points throughout the film. The film followed an arborescent structure and stopped at the different intersection points to allow public interaction.

The film lasted twenty minutes, but the ticket that the spectator bought allowed him/her to watch the film as many times as desired. Although the film version was not very successful, six years later, the DVD version would be released. One of the problems with the screening in movie theaters with a voting system is that a part of the audience, those with the least votes, can not enjoy their choices. This problem has been overcome with the DVD version.

Currently, with the consumption habits and the possibilities of network communication technology, this obstacle has become less relevant, allowing the creation of interactive products for individual use. Interactivity with voting system by the audience was adapted by some television programs, usually using telephone

voting.

However, several scholars consider the film *Smoking/No Smoking*, by Alain Resnais, 1993, the first film to be internationally regarded as an example of interactive cinema. *Smoking/No Smoking* deals with choice. The audience is given the choice between two opposing situations: smoking or not smoking. In addition to the initial separation of the two films, each film also contains six bifurcations resulting in six different stories within the same narrative. Each film is projected simultaneously in different rooms. This way, the audience chooses the initial action of the plot by choosing the room.

In 2002, Lev Manovich conceived *Soft Cinema*, a software that randomly displays sequences of images and music stored in a database. Although the montage technique can be found here, the intrigue in the narrative is non-existent. The montage sequence is pre-programmed by the viewer's interaction with a keyboard. The narrative is generated by the database. According to Manovich (2010), the database is the counterpart of the traditional narrative form.

In 2003, Peter Greenaway releases an ambitious transmedia project entitled *Tulse Luper Suitcases*, which includes four films, a 16-episode television series, a set of 92 DVDs, CD-ROMs, books, exhibitions, installations, concerts, a play, web sites and an online game entitled *The Tulse Luper Journey* (Greenaway, 2003). This game offers the player the possibility of exploring a puzzle that is unveiled with the visualization of each of the 92 fragments that make up the film. These fragments represent the life of the character Tulse Henry Purcell Luper, who packed his life in 92 suitcases distributed throughout the world. It is up to the player to put together the character's life using the evidence found in the suitcases.

Greenaway thus tries to break with Griffith's model of narrative cinema, based on the settings and on the actors, to venture into a project that expands itself, dadaistically, through diverse media and diverse spaces, with tenuously defined contours, where the limits between cinema, performance, visual arts and digital media dissolve. Like Joseph Kosuth's *One and Three Chairs*, which features a chair, the photograph of that chair, and a definition of the word "chair" taken from a dictionary, Greenaway also works around the object, the picture, and the concept, but on a larger interactive scale

and using different perspectives. While Kosuth is interested in problematizing the relation between object, picture and concept, Greenaway uses the three elements with the purpose of self-reinforcement. With his project, Greenaway seeks to challenge not only traditional cinema technology, but also its structure, which, according to the author, has not gone beyond illustrated text.

Greenaway is rather critical about cinema, stating that cinema is passive and therefore does not evolve with digital technology. The author goes even further and announces that the death of cinema took place on September 31st, 1983, with the introduction of the remote control in domestic households (Greenaway, 2007). Greenaway's project invites the viewer to participate actively in his work, by taking him/her to different environments such as cinema rooms, television, theaters, streets, art galleries and the internet. The contents and the mediums are an unfinished and constantly growing network structure. Like most of Greenaway's work, this project has no emphasis on narrative and is an encyclopedic cluster that explores the dialogue between art and technology. The viewer is given the opportunity to immerse himself/herself in the work exploring various means and senses. The viewer sees, hears, touches, accesses and participates in the process of creation.

In 2009, director James Cameron releases the interactive trailer for the film *Avatar*. This trailer may be downloaded from the official website [www.avatarmovie.com/air/] and installed on the computer. The viewer has the option of watching the trailer without interruptions or relishing the interactive possibilities. The interactivity lies in the possibility of the viewer deciding whether to receive additional content on the film. The timebar includes eleven points that correspond to small stops, during which the viewer has access to one of the characters. These links allow the viewer to watch more details on an additional video.

The trailer has 3'32'' minutes, but, with the additional videos, it reaches 18'45''. There is also the option to check out the latest Twitter posts related to the movie and to download other content, such as the soundtrack of the film.

In 2010, Jung Von Matt produces *Last Call* (Jung Von Matt, 2010), an interactive film project, created as a commercial piece for a channel owned by NBCUniversal. It is a short film that was played in German movie theatres. The film tells the story of a

female character stalked by a Serial Killer. While trying to escape, she finds a cell phone, which she uses to establish contact with the members of the audience. These may help her with the decisions she has to make during the narrative. Upon entering the room, the viewers receive an invitation to submit their mobile phone number on a specific digital platform, which will enable them to receive calls from the protagonist, at any time. At certain points in the movie, the main character randomly calls someone in the audience and asks a question about the path to take or the decision to make. A voice recognition software captures the viewer's decision. Based on the answer, the protagonist will take the path suggested by the viewer, following a specific sequence of the story. *Last Call* includes a series of paths and possible endings based on the interaction of the viewers, who determine changes in the narrative, giving them the feeling of control over the story.

In the same year, 2010, *Scenario*, a 3D interactive film, was released (Scenario, 2010; Coutts, 2011). The film was developed at the iCinema Centre for Interactive Cinema Research, at the University of New South Wales.

The film is projected onto a 360° widescreen with motion sensors which track the audience. The interaction happens between the human participants and the humanoid creatures on the screen controlled by the artificial intelligence mechanism of the film. The narrative unfolds depending on how the audience interacts with the film.

Sufferrosa, a project by the multimedia artist Dawid Marcinkowski, was released in 2010 and is an interactive, non-linear narrative that combines music, film, photography and the internet (Sufferrosa, 2010). *Sufferrosa* was screened at various festivals and exhibitions, such as MOVES International Film Festival and OFFF Post-Digital Culture Festival. The plot of the film centers on the protagonist, the detective Ivan Johnson, who is searching for a missing woman. The spectator becomes the protagonist, and immerses himself/herself deeply in the narrative meeting several characters along the way and finding links that help to unravel the mystery. The film is based on the premise "What happens in the film depends entirely on the viewer's choice."

The film consists of 110 scenes, 3 alternate endings and 4 Levels -1, 0, 1 and 2. Interactivity is accomplished when the viewer hovers the pointer of the mouse over

the pictures, movie clips, and links that provide the necessary information for the progression in the film sequence. At any moment, the viewer is able to see the map of the clinic where the action takes place, which offers an overview of all the optional links and their location.

The links only become visible when the viewer moves the pointer of the mouse over certain areas of the screen, which implies exploring and discovering the different options available. Although the viewer chooses the links, finding them happens randomly, as it results from the exploration of the movement of the mouse over the screen. Therefore, the sequence of the film is also random.

In 2014, the production company Filmstrip started the project *Biosuite* (Filmstrip, 2014) in collaboration with the Sonic Arts Research Center (SARC), at the University of Queensland. In order to control how the film narrative unfolds, this project explores the emotional reactions from the audience, using Electrocardiogram (ECG) signals and Galvanic Skin Response (GSR), which measures a person's skin conductance levels. These signals are interpreted by a computer-run software and determine the changes in the film narrative, as well as the creation of sound effects.

There are very few examples of film interactivity with mobile devices; one of them is by Häkkinen et al. (2014), who enables interacting with the content of the 3D film in movie theaters using a mobile phone. Viewers can use their personal devices to access different pieces of information, such as additional data about the producer of the soundtrack being played or a discount voucher for some of the accessories worn by the main actor. However, this project is quite different from the one set out in this study.

Given the above information, there are a number of ways to develop interaction. One of the paradigms of human-computer interaction are 3D sensors, such as Microsoft Kinect (Kinect, 2014), Asus Xtion (Xtion, 2014), Leap Motion (Leap, 2014) or Structure Sensor (Structure, 2014). Those sensors can be used to interpret specific human gestures, enabling a hands-free control of electronic devices, manipulating objects in a virtual world, or interacting with augmented reality applications. Many of those tracking and gesture recognition sensors are extremely important in the video game industry. With the appropriate software, the sensors also have the ability of

tracking the user's skeleton and/or tracking a single user or multiple users. The sensors are able to accurately replicate the user's hand gestures and movements in a three-dimensional manner.

Several research centers have emerged in the area of interactive cinema, among which two stand out: the Interactive Cinema Group, directed by Glorianna Davenport, founded in 1987 by the MIT Media Laboratory in Cambridge, Massachusetts, and the iCinema Center for Interactive Cinema Research, led by Jeffrey Shaw, founded in 2002 by the University of New South Wales, Australia. While the first one (in the meantime inactive) had as its main focus on the investigation of formal structures, construction methods and the social impact of the distribution of interactive films, the second embraced a wider scope, exploring the technological development of immersive systems.

3. MODELS

We now need to classify the above-mentioned experiences. Therefore, we tried to find a set of models capable of including all interactive films: (a) the arborescent model, based on a simple one-off choice made at certain moments in the narrative, where the viewer can choose paths A or B, for which we may use the film *Last Call* as an example; (b) the constructive model, which involves multiple interpretation, according to the options offered by the project, where we can include the experimental film *Haze*; (c) the paired model, which allows the incorporation of content external to the narrative, as in the film *Take This Lollipop*; and (d) the fertile model, whose process of interaction between spectator and film entails the creation of new content, although such a film does not yet exist.

The last model (fertile model) is presented as the possibility of rupture with the sequence of experiences that have been carried out since the middle of the last century. The interactivity of these films has always been limited to the possibilities of choice

offered by each project. Therefore, there can only be an effective process of interactivity when the viewer is given the possibility of generating new content that is not predefined. This possibility of effective human-machine interaction is especially complicated if we take into account the use of “real” image, captured in the real world and, therefore, dependent on previously made footage. However, if we think about animated films, the creation of new narrative continuities may be a reality in the near future.

4. TIME AND THE TALES

A key issue in this project is time: time at cinema. First of all, it is important the temporal experience of the film narrative by the conventional viewer, as well as by the spectator-protagonist. In the first film, *Haze*, this issue has been developed through the spectator-protagonist, who experiences the same moment more than once, until that very moment becomes something else: a moment that is both the same and another. Thus, the space-time relation becomes a space-times relation. In the second film of *The Forking Paths*, *The Book of the Dead*, the time issue focuses mainly on the interpretation of the film, offering the spectator the possibility to read at his/her own pace, as if he/she were reading a book. As theoretical basis (Silva, 2013), the notions of movement-image, time-image and crystal-image, proposed by Deleuze, serve as structural basis for this work. By appealing to viewer immersion, they cause a reaction contrary to the usual passive-submissive reaction. According to Deleuze (Deleuze 1990: 29), the sensory-motor sensations, indirect representations of time, tend to be replaced by exclusively visual and audible conjunctures, namely the opsign¹ and the sonsign², direct representations of time. Through this theoretical background, *The Forking Paths* uses eminently visual situations in the film *Haze*, by means of a subjective camera and the exhaustive repetition of images, endeavouring

¹ Purely optical description, where the spectator (the one who watches) replaces the protagonist (the one who acts).

² Purely auditory description, the same principle of opsign.

to meet the opsign concept. It is also related to the concept of sonsign in sound situations that arise without any corresponding or related images. In the film *The Book of the Dead*, the concept of opsign is closely related to moments where two parallel planes, connected by the same sound, occur simultaneously (according to the spectator's choices). These moments (always referring to the present) take place simultaneously in two different spaces, by changing the space-time relation to a space-space-time relation.

We found the indicated features in the work of Italo Calvino (Calvino, 2002), taking into account (the tale) and the background theme (time) to convert the literary text into film text in the films *Haze* and *The Book of the Dead*. These choices were made on an experimental perspective and, although in formal and conceptual terms they coincide with the structural lines of the project *The Forking Paths*, they are admittedly a personal choice. In these tales, the idea of interactivity is present through the game³ that the author develops between the narrator and the narratee, as well as the idea of virtuality. According to Lévy (Lévy, 1995), imagination, memory, knowledge, and religion are factors of virtualization that made us abandon the physical presence long before the arrival of digital networks. Another author whose work addresses the question of time (of the time that is parallel, multiple, which forks and simultaneously crystallizes at the present) is Jorge Luis Borges. The name of this project pays homage to the tale *The Garden of Forking Paths*, which addresses issues related to the possibility of multiple choices and, especially, of multiple experiences, such as the ones in the interactive films we have produced.

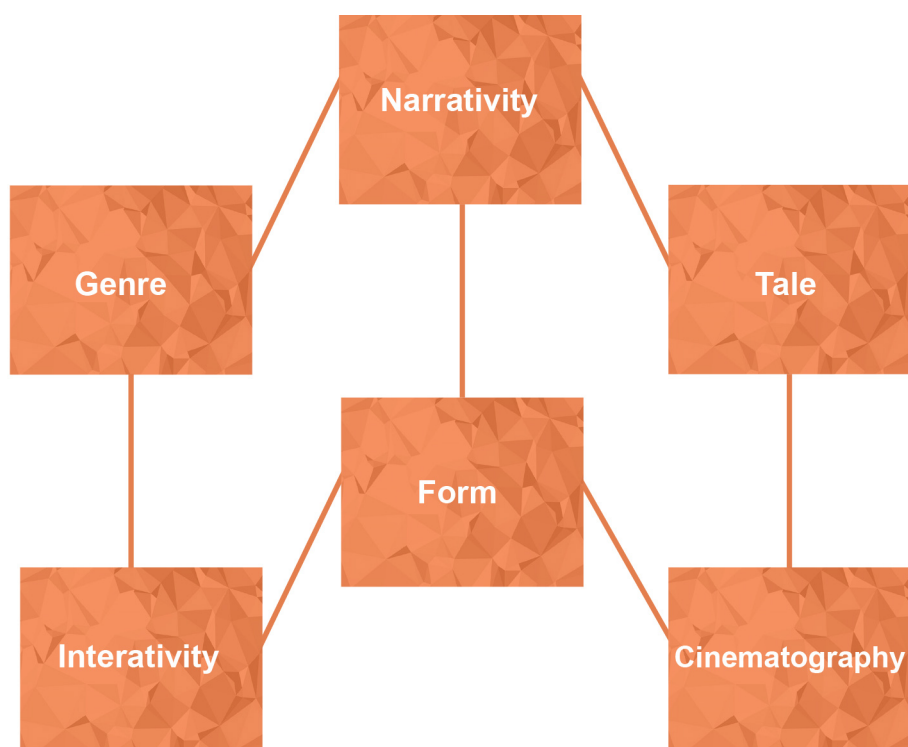
5. THE FILM

³ Johan Huizinga sees the game as a piece of the time narrative where the player plays another parallel life and points out in his book *Homo Ludens: The Play Element of Culture*, the essential importance of the game in building the culture of any society.

An original script was written for the film *Waltz*, while *Haze* and *The Book of the Dead* are based on stories written by Italo Calvino, however, all three rely on an experimental dimension, both at formal and aesthetic levels. Therefore, the following parameters were taken into account: (a) narrativity – the search for new relations between the narrative and the spectator; (b) cinematography – the search for filmmaking processes suitable to the interactive models; and (c) interactivity – the search for interactive technologies suitable for cinema.

Within this framework of thought, which tries to find solutions simultaneously creative and functional, we can still find the following interceptions:

1. At the intersection between Narrativity and Cinematography, we chose a tale that would enable the convergence of these two parameters.
2. At the intersection between Narrativity and Interaction, the audiovisual Genre of the narratives was taken into account, so that the choices regarding the interactive technologies were safely made.
3. Finally, at the intersection between Narrativity, Cinematography and Interaction, we can find the Form through which the film is presented to the spectator and developed with him.



Picture 1 – Framework of conceptual interceptions.

The interactive film *The Book of the Dead* (Picture 2), from 2015, tries to interact with the viewer at two levels: by controlling certain actions of the characters and by controlling the narrative time, allowing the spectator his/her own reading pace. When we read, we use our own reading pace, we can read slower or faster, but when we hear someone else reading, we depend on a reading pace that is not our own and to which we must adapt. The same happens when we watch a film: the viewing time is imposed by the pace of the film editing, which can be faster or more contemplative. In *The Book of the Dead* the viewers are the ones who choose the length of each plan. Therefore, the film offers an opportunity never experienced before: the viewer has control over the film narrative pace. This possibility enables the spectator to adapt the reading time of the moving images to his/her personal pace. This control works in a very simple way, by clicking on the image. After perceiving the action inherent to each plan⁴, the viewer can move to the next level or, if he/she so chooses, he/she can remain in the same plane and get to know its content better, both aesthetically and narratively. On the other hand, the viewer is also given some choices at certain points in the narrative. This possibility takes place within the scope of an arborescent structure, where it is possible to choose between paths. Those choices are confined to key moments in the narrative and are made by clicking in certain areas of the screen. These choices function as paths parallel to the central narrative and do not alter its predefined course. *The Book of the Dead* takes place in the 20s, when two ladies are trying to get rid of a corpse in a spring evening. This is the premise for a series of adventures that invariably end badly. This interactive film is designed to be viewed both on the internet and on mobile devices. It is therefore a movie prepared to be viewed individually. The trailer is available at <https://vimeo.com/127651062> and the full version of the film at <http://oscaminhosquesebifurcam.ciac.pt/livros-dos-mortos.html>.

Technically, *The Book of the Dead* was filmed with a Canon EOS camera. Several technical resources were used when filming, such as cranes and distinct lighting systems. Particular attention was given to colour relations between the different pictorial elements. It is also important to point out that the movie was shot entirely at

⁴ A plan is a part of the film between two cuts. However, in this specific case, the viewer is the one who redefines the plan according to his/her choice regarding the second cut.

night. Among the film settings, the most particular is perhaps the Estoi Palace (Picture 3), an 1840 building, famous for its tiles and its garden sculptures⁵. Five semi-professional actors and a former star of the Portuguese television, Luís Pereira de Sousa, were chosen to play the characters, so that the viewer could identify the actors more easily. With regard to the technical staff, the team that directed and produced the interactive film *Haze* remained roughly the same, as it can be attested in the closing credits of both films.



Picture 2 – film scene picture by Jorge Jubilot (Chão Limpo, Quatrim Norte).

⁵ In the film, it becomes difficult to perceive the existence of one of the characters because we may confuse him with garden sculptures. The tiles also have an important role in the pictorial composition of the setting.

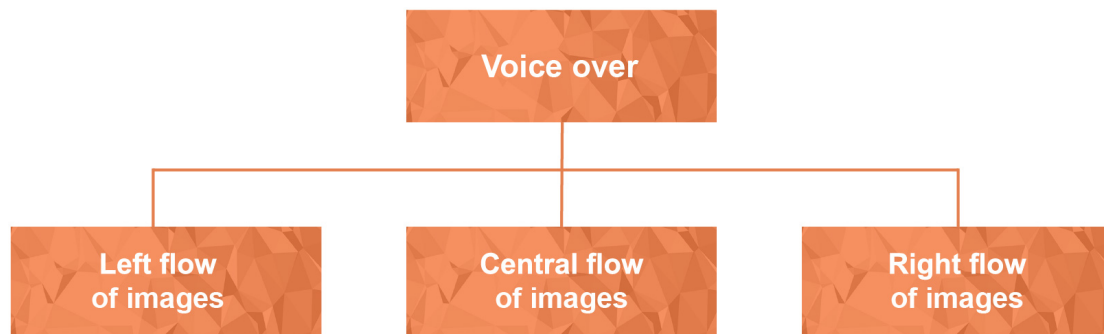


Picture 3 – film scene picture by Pedro Jubilot (Estoi Palace).

The Interactive film *Haze*, 2014, was released to the public between June 16th and July 16th at the International Electronic Art Festival – FILE 2015⁶. It dismounts the tale *If on a winter's night a traveller*, by Italo Calvino, into sound and visual fragments which repeat themselves until they lose meaning (or gain new meaning, as we will see below). That process intends to offer the viewer the status of spectator-protagonist. By means of distinct morphologic resources, it allows the viewer to become the main character in the narrative, i.e. it enables the spectator to transit from a passive role (extradiegetic) to an active role (intradiegetic). A voice-over establishes a dialogue with the viewer to achieve that transition. We call it Polish narrator (as we have seen, it is a narrator who dubs the dialogues of all the characters). The Polish narrator is the first contact that the spectator has with narrative and he guides the viewer in the immersion process through pieces of advice and confidences. With the unfolding of the narrative, the distinction between the Polish narrator and the spectator-protagonist becomes increasingly blurred, helping to deepen the dark and mysterious atmosphere. Moreover, given that the film is divided into three distinct image flows, sometimes with changes in character gender between the flows, the

⁶ http://file.org.br/videoarte_sp_2015/file-sao-paulo-2015-video-art-53/

Polish narrator dubs all the lines of the characters in the film (including the cues of the spectator-protagonist). The narrative structure cannot be altered; however, the filmic experience depends on the choices made by the spectator-protagonist for the previously mentioned flows. These flows (Picture 4) are divided into central, lateral-right and lateral-left, and the path between them is the responsibility of the spectator-protagonist. Navigation between flows is achieved by hovering the pointer of the mouse over both sides of the image.



Picture 4 – structure of the narrative in three flows.

As for the experimentation with the idea of time in cinema, *Haze* repeats all planes three times, interspersing them and attempting to interfere with the time perception of the spectator-protagonist. The plan repetition can cause three types of reading (Silva, 2014): (a) emptying the meaning of the image, through the loss of the seduction aroused by the first viewing; (b) enhancing the image, by discovering details which may not have been perceived at the first viewings but may become important as the narrative unfolds; (c) enhancing the image, by discovering details that did not exist in the first viewings.

As already mentioned, the film can be viewed both individually as well as collectively. Individually, through devices with internet access. Collectively, it can be viewed in physical screens. In the second option, the central flow is projected and the lateral flow may be accessed on synchronised devices. Thus, several spectators-protagonists may coexist in the same viewing. A Canon EOS camera was also used in the production of this film. The shooting took place in a black box (the theatre lab of CIAC at UAlg). In addition, a smoke machine was used to create an environment suitable for the unfolding of the narrative (picture 5), enhanced by the absence of colour throughout the film. The result was the absence of the spatial dimension of the

story. Although the Polish narrator (voice-over) makes numerous references to an urban area involving a train station, that physical space is never explicit. There is nothing. Neither in nor out of the station. It was thus intended that the space-time relation in the film was entirely dominated by the time dimension.



Picture 5 – frame shot 36 B (right flow).

Waltz (picture 6), produced by Rui António, is a film composed of five intersecting narratives. Each of these narratives can be viewed independently; however, the five narratives together build up a film footage. The action of all narratives unfolds in the same chronological space. Through the montage, the viewer can switch between the characters and choose the sequence of the film. Each of the five characters has its own story, which is somehow connected to at least one of the other characters. Thus, these characters share anguish, betrayal, love, disappointments and hope, in a film structured in layers, which unfold and complement each other as the different plots and intrigues interweave.

Despite being an experimental film, an attempt was made to include in the narratives some elements that made them accessible to the audience. The narratives intend to involve and capture the viewer's attention through emotional moments, which embrace various film genres, such as suspense, drama and comedy.

The plot has a closed ending, as in the classical model, and it has a linear time

structure.

Depending on the interaction of the viewer, we obtain different film footage. The conceivable layouts correspond to the different possible sequences resulting from the different interactive choices made by the viewer. The film *Waltz* lasts 6 minutes and 30 seconds and has 25 alternative flows for each moment. Taking into account that the viewer may interact every 5 seconds (empirical value, since the viewer may, in fact, interact more often, though such use of the film would prevent the viewer from fully enjoying the narrative), we can calculate the number of interactive moments as follows: $d \times 60 / i$, where d = film duration in minutes, and i = frequency of interaction in seconds. We therefore have 78 possible interactive moments in the film ($6.5 \times 60 / 5 = 78$).

We may calculate the arrangements as follows: $A^! = n^!$, where $n = 25$ and $p = 78$, with $A^! = 25^!$.

This number corresponds to the total amount of possible arrangements, i.e. different film sequences, for a 5-second interaction with the viewer. If the viewer interacts less often, there will still be a very large number of possible different sequences. As an example, if the viewer interacts only 6 times throughout the entire movie, there will still be 244,140,625 different possible montage sequences. Thus, it becomes clear that the possibility of viewing the exact same film sequence becomes exceptionally small. There are two versions of this film: (a) a Kinect sensor version – the image is projected by a video projector onto a wall or screen and the film montage is made by the viewer's lateral and longitudinal body movement; (b) a version for mobile devices – this version enables the viewer to watch the film on different devices, such as smartphones and tablets, and the interaction is made by touching and combining finger touches on the screen.



Picture 6 – photogram of the film *Waltz*.

6.THE PLATFORM

The Arts and Communication Research Centre (CIAC) of the University of Algarve has been producing digital artefacts (Silva 2014; Silva, Rodrigues, Alves, Madeira, Ferrer, Casta & Martins, 2014; Silva & Dominguez, 20114) which promote the interconnection between arts and technology, and part of the developed products are the result of projects in the area of interactive cinema (Silva, 2014; Silva, António & Rodrigues, 2015). These applied research lines, whose guidelines have served as a starting point for the emergence of several doctoral projects (Tavares, Cruz & Paulino, 2014; Silva, António & Rodrigues, 2015), are based on the development and evolution of audio-visual language. On the other hand, the production of platforms (Silva & Costa, 2014), whose objective focuses on creating, fostering and expanding networks of excellence in the areas of culture and digital art, has been the area where CIAC has greater visibility. It is also important to remember that we live in a benjaminian (Benjamin, 1985) post-aura time (or perhaps neo-aura), where the

relation between author-work-public has undergone a paradigm shift. This new interconnectivity also includes cinema and offers the viewer an active co-authorship role regarding the ending of the film.

It is in this context that platform *The Forking Paths* emerges, prepared to support and/or host films for collective or individual viewing. The platform is hosted at <http://oscaminhosquesebifurcam.com> and despite working through scroll down it is divided as follows:

1. Home: where the menu of the platform is displayed. The background image visually explains the idea of forking paths and the chromatic gradient, which begins with cool colours and ends with warm colours, takes us to the beginning of a journey that promises to be intense.



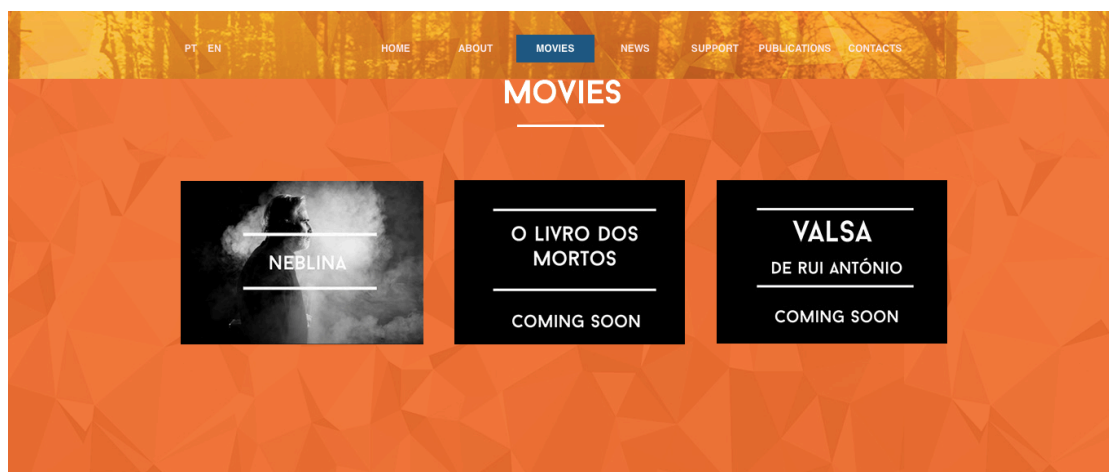
Picture 7 – homepage of the platform

2. About the project: it is introductory page of the project, featuring a small synthesis, as well as the logo: a stylized cat. The cat appears in the film *Haze* with a realistic look and in the film *The Book of the Dead* with the same appearance as in the platform. When we get to this page, the cat, which is initially sitting, gets up (as a warning sign) through an animation.



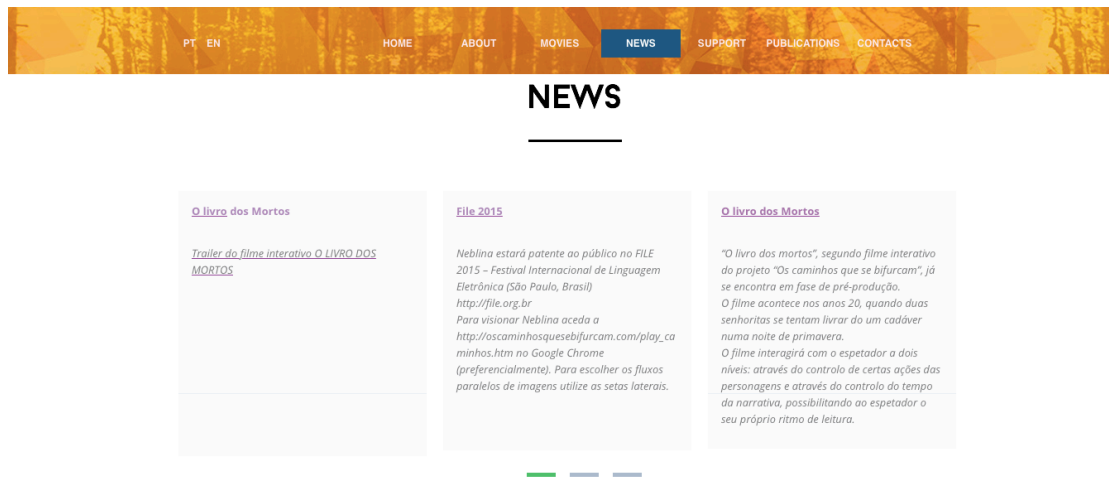
Picture 8 – page *About the project*.

3. Films: it is the presentation page for the films that can be viewed or to which you can be redirected by selecting the one you choose. The film *Haze* includes two display options besides the explanation on the interactive method: collective viewing, in movie theatres, and individual viewing, on devices with internet access.



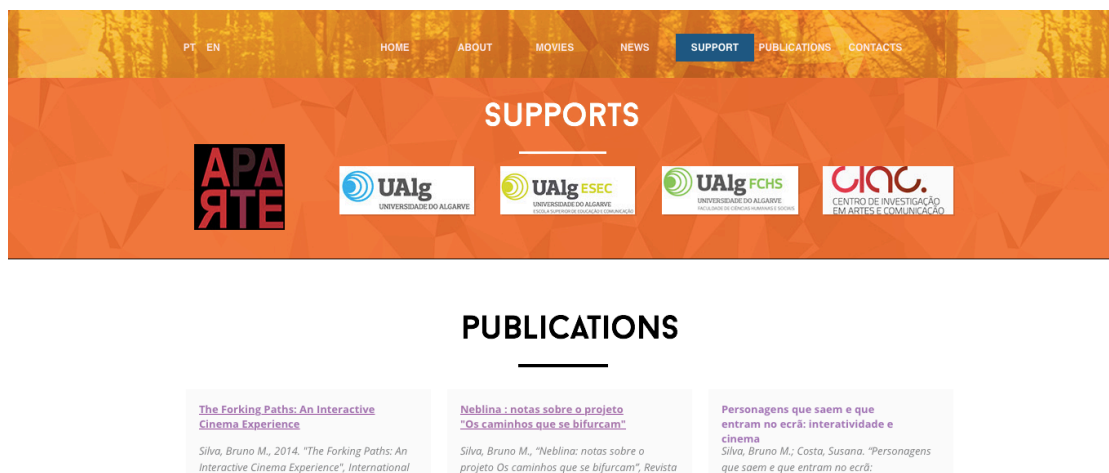
Picture 9: the presentation page for the films.

4. News: page where news about the project and the films is disclosed.



Picture 10: News section.

5. Support, publications and contacts: pages disclosing project support, scientific publications related to the project and, finally, the contact information (e-mail, skype and personal page) of the person responsible for project.



Picture 11: pages related to project support, publications and contact information

7. CONCLUSION

The fascination for the issue of time and its relation with cinema was the *leitmotif* of the project *The Forking Paths*. Psychosomatic processes, which can create different sensations and, consequently, different perceptions regarding its passage (so many times divergent from the measuring devices – watches), acquire in cinema an impending experimentation potential. It was that potential, which had already been addressed in literature (in particular through tale) by authors such as Jorge Luis Borges and Italo Calvino, that we have tried to bring into the project. We think we can find in *The Forking Paths* a certain evolutionary trend (Reia-Batista, 2006; Murray, 1997) regarding audio-visual language. Therefore, although the morphological issues remain unchanged, we found signs that appear to indicate a possible evolution within the audio-visual syntax. Namely the relativity of the concept of plan, which alternates from an objective into a subjective stance, taking into account the possibility of multiple choices, as well as the multiple interpretation possibilities of the idea of sequence, following the same principle. It is important to remember the role of the viewer, who not only becomes an active part in the narrative but can also undertake the task of co-authoring, taking into account the possibilities of choice he/she is offered and the substantial changes in the narrative structure those choices inevitably bring to the viewing of the films. It is also necessary to underline the importance of academic experimentation, which should, whenever possible, go beyond theorizing and involve a praxis through a demonstration of the developed theories. Within the scope of the models found (arborescent model, constructive model, paired model and fertile model), the possibility of generating new content (fertile model) through the interaction man-machine is regarded as the most likely possibility of rupture and the development of a new generation of interactive movies. The viewer acquires creative powers that are beyond his/her control (as well as beyond the author's control): the creation of content that was not foreseen. This will certainly be a rupture in the logical sequence of the history of cinema, where the film will become something that has never been so far: a complete audio-visual experience. This is hence a limitless project, which has taken on a life of its own and wanders around.

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