Accessing Movies' Emotional Information

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Abstract — **Emotional information is being used in several systems as a way to understand users while interacting with computers or as a way to explore content classification. Movies are a medium emotionally empowered and technological developments and trends for media convergence are turning video into a dominant and pervasive medium, and online video is becoming a growing entertainment activity on the web. In this paper we present a user interface for movies' emotion exploration based on a previous usability study. Felt – is an application for movie and users' emotions exploration as a way to access movies by its emotional properties or as a way of recommending movies by the analysis of users emotional profiles. In this paper we also propose novel interactive mechanisms for movie's emotions exploration.**

Keywords - usability; emotional feedback; interaction; movies content classification.

I. INTRODUCTION

Information systems research area is, in fact, in a mature stage of its life, giving space to the analysis of some aspects of information that usually are tagged in different areas of research but that today can be analyzed into this field. Emotional aspects, usually analyzed in the Human-Computer-Interaction is now treated as other types of information, that can be used in different cases, such as monitoring users' stress or boredom while interacting with applications, or for example using emotional information to classify content. This kind of feedback information is more and more used and beginning to become accessible as for example in child toys [1,2]. Video, as web content, is proliferating over the last years due to a set of circumstances such as the creation of websites like Netflix[1], or Mubi where video plays a central role. The popularity of such websites can be verified by the massive uploads made per day. Recent reports [3,4] show that video usage is growing over the Internet as an entertainment source and as an education resource. Specifically, the report from Pew Internet & American Life Project [5] states that seven in ten adult Internet users have used it to watch or download videos, movies or TV shows. The viewership by adult Internet users increased since 2007 to 2010 from 16% to 32%, including educational videos and continues to increase to 78% in 2013. Another study from 2013, from Ericsson [6], where 15000 online users with a broadband connection and watch TV/video in a weekly basis were interviewed, found that 66% of the viewing priorities is watching good movies. Moreover, video compression and streaming techniques, larger bandwidths and larger digital archives are transforming video into one of the most dominant media, and online movie visualization is becoming one of the key trends for the next years [7]. These facts justify the necessity of having new and more powerful video access and exploration techniques that help users in finding, among others, entertainment and educational videos on the Internet. Also, in the last decade, emotion research has been steadily growing and became, nowadays, a firmly established field of research, as researchers became more and more aware of the importance of emotions in the human-computer interactions. For example, a number of researchers have pointed out the need to take into account the emotional characteristics of users in the context of user interfaces usability [8, 9]. Because movies are loaded with a great amount of emotional information, they can be explored to improve the development of emotion aware systems. One example of this improvement is that movies can be useful to boost people's emotions and, having the necessary means, it is possible to measure this information, which turns out to be valuable information to be treated and applied for emotion aware applications. Clearly, emotions are always present in the mind of users because they are a natural part of the way people react to their surroundings. And as importantly, frustration, confusion, anger, anxiety and other similarly negative emotional states may adversely affect the way users explore entertainment applications, much in the same way as it negatively affects productivity, learning, social relationships and, ultimately, people's well-being [28]. In this paper we present an interface for movies' exploration based on emotional aspects.

II. RELATED WORK

Nowadays, huge amounts of data are being uploaded to the Internet, ranging from texts to audio or video. Such data, when properly organized, accessible and reachable, represents information and meaning [10], but without this organization it could mean just chaos and noise. Also, relations between data represent more information that, in huge, complex, dynamic and heterogenic information systems, demands for suitable visualization and interaction techniques [10]. As suggested by Neisser (1976) [11], "cognition is the activity of knowing: the acquisition, organization, and the use of knowledge". Perception is the first step of the cognitive activity and it consists in the apprehension of stimulus. Visual perception enables to successfully navigate and explore through an environment,

[1] Available online at: http://www.netflix.com

which is why it is so important the way information and interactive mechanisms are represented. Information visualization is the discipline that presents and explores information for better perception and understanding. In our times, computers play a major role as a cognitive tool, and the representation of information in their displays is an important mean for computers to communicate with humans [12]. Human beings often use metaphors to understand the meaning of abstract concepts, or to process new information [13]. These metaphors are used both in daily life (e.g. "life is heavy") and in scientific knowledge (e.g. "processes of repairing tissues"), and they help dealing with a new reality, using a pre-existing one. Thus, representing mechanisms that we already know help human perception to easily detect the meaning or functionality of new information. We analysed how emotions are being worked in actual systems and how they are being represented, in fact, we were interested in analyzing how information visualization techniques help human cognition and then we investigate how emotions and videos are both being represented and explored by current systems. In the context of video visualization, Film Finder [14], allows users to search for certain films with different types of visualization support based on the movie duration (minimum and maximum), genres, titles, actors and directors. The selected movies are presented in a star field graphic based on their date and popularity. In this approach, users may find movies based on their tastes or preferences, and explore the movies space by zooming in and out of more or less detailed information. Most visualization tools and applications found in recent surveys, such as the one in Perez (2008) [15], do not however address video. Exceptions include: 1) "Call and Response [2] " experimental project, that visualizes a communication network made through short videos among art students, representing videos by one keyframe, and focusing on the communication; 2) "YouTube", that was available in a previous version until about three years ago; 3) "Video Sphere" [16] 4) Yasiv, a visualization tool for YouTube related videos. These last three are the ones most related to the objectives of the work described in this paper. From each video on YouTube, the user could access a 2D view that represented videos as circular scattered still images, providing access to the traditional page where users can watch the video. It allowed for visual neighborhood navigation, but provided limited functionality and information about the videos or the video space. On the other hand, VideoSphere represents TED's videos as a video space around a 3D sphere, with links among the videos, reflecting semantic compatibility, and allowing navigation around, inside and outside the sphere. In this case, the visualization is restricted to the videos represented on that sphere, with the focus on exploring semantic relations, without any special support for the visualization of the videos other than still keyframes and traditional video play. A more recent work, YASIV [3], is a search mechanism that displays YouTube related videos, sizing each video window according to its number of views. The relations between videos reflect YouTube's relation policy; what Yasic does is to graphically arrange the YouTube related video list, by displaying them in clouds. We were also interested in comprehend how emotions could be represented. We looked into the different emotional models such as categorical [17], dimensional [18], appraisal [19] and find that color was the more visual representation of emotions [20], thus a visual representation of emotional models should be explored in the context of video emotional classification systems to improve the perception and understanding of this type of information, along with interactive mechanisms for improving its usability, which is precisely the main motivation of this work.

[2] Available online at: http://www.risd.tv/callresponse/leptonRun.html

[3] Available online at: http://blog.yasiv.com/2012/02/introducing-YouTube-visualization.html

III. A SYSTEM FOR MOVIE EXPLORATION BASED ON EMOTIONS

The representation of emotional aspects in everyday applications is quite uncommon. Movies are by definition one of the most emotional media, because of their "impression of reality" that turn users more empathetic and vulnerable to their content; Movies can indeed affect viewers' emotions and perceptions [21]. Their impact is obviously related to a diversity of individual differences such as historical periods, viewers' pleasures, desires, affects and moods. Whenever people think of motion pictures, they often remember the higher emotional impact movies and then they remember those scenes that turned that particular movie so unforgettable. But sometimes, even those scenes become impossible to recall, among hundreds or even thousands of movies people watch in a few years. Thereof, with this system, we tried to collect and present to users a set of emotional characteristics about movies, describing the feelings of the person who watched a particular movie, along with their movie profile, and we also created some visual interface mechanisms to help in exploring such emotional information. Specifically, we developed a system –iFelt – that consists of an interactive web video system designed to learn users' emotional patterns and make use of this information to create emotion based interactions. As stated before, in this paper we present a set of modifications of the iFelt interface, based on the results of a usability test of a previous version but also propose a set of new mechanisms for movies' emotion exploration. So, we will first explain our interface and design goals, we will then present a summary of the conditions of the usability study, then present the set of modifications of this new version of the interface based in the results of the usability test fully explained in [29], and then present the novel interaction mechanisms for exploring movies emotions.

A. iFelt System Description

iFelt is an interactive web video system designed to learn users emotional patterns, create emotional profiles for both users and videos, and explore this information to create emotion based interactions. The iFelt system is composed of two components. The "Emotional Recognition and Classification" component performs emotional recognition and classification (automatically, through biofeedback sensors, and manually through user input) in order to provide movies' classification based on emotions [29]. The "Emotional Movie Access and Exploration" component explores ways to access and visualize videos based on their emotional properties and users' emotions and profiles [29]. In this paper we will focus on the Emotional

Movie Access and Exploration component, more specifically in the user interface aspects.

B. User Interface goals

It was designed to explore the affective dimensions of movies in terms of their properties and in accordance with users' emotional profiles, choices and states. Although iFelt supports any kind of video, we focused our analysis on movies. iFelt user interface has the following five main goals:

- To visually represent movies by emotions in such a way as to facilitate user understanding of the inner concept, i.e., users should easily understand the graphical symbolisms used in the system's interface and its interactive mechanisms.
- To enable accessing, searching or finding movies based on emotions felt by users, i.e., the system should provide novel, perceptive and simple mechanisms in order to enable users to access movies by emotional characteristics.
- To facilitate browsing millions of movies from an affective perspective, i.e., the system should be designed in such a way that users can browse lists containing large numbers of movies and visually detect those who are more relevant given a particular emotion, always having the perception of the emotions that categorize each movie and their intensity.
- To enable recommending movies by analyzing users with similar movies playlists and emotional classifications.
- To be easy, useful and fun to use and designed to follow established usability guidelines.

C. Design Assumptions

Regarding the choice of the proper emotional labels, we took into account Ekman's [17] basic categorical emotions for being the most agreed upon (happiness, surprise, sadness, fear, disgust, anger) and added 13 additional labels besides the basic ones, due to the fact that those basic six emotions are too narrow to properly characterize the emotional complexity of movies. In our study regarding viewers' attitudes, awareness and preferences about the emotional impact of movies [29], it was interesting to note some tendency in preferences of emotions like surprise, fun, feeling good, happiness, and mostly, imagining, dreaming, inspiration and motivation, towards the search of engagement and meaning beyond positive emotions, and suggesting the need to address wider models of emotional impact. Having followed these results and the literature both from psychology, based on the work of [19], and from movie eliciting studies, based on the work of Gross and Levenson (1995) [22] and Rottenberg et al. (2005) [23], we chose, the additional 13 labels that in our opinion best describe movies. Based on the 36 affect categories from all those studies we reviewed, we then created 6 main categories, which correspond to the 6 Ekman's basic emotions and a set of labels to specify each one that fits in each emotion. We now present the full list of our proposed emotional labels to categorize movies:

1. Happiness: involved, amused, inspired, tender.
2. Surprise: curious, astonished.
3. Sadness: melancholic, compassioned, bored.
4. Fear: scared, disturbed.
5. Disgust: embarrassed.
6. Anger: irritated.

We decided to provide more emotional labels for the "Happiness" category because there are more negative than positive emotions in our list of basic emotions.

Regarding the types of classification we applied, automatic and manual, must be explained. We are exploring ways to present emotions gathered through both automatic (psychophysiological sensors) [30] and manual methods. In this proposal, we opted to have more emotions than the automatically recognized (only basic emotions), which left us with the problem of determining what or who classified a movie: a sensor or a user. In fact this raised the problem that movies can have a sad narrative all along the movie, but in the end viewers may have the sensation of inspiration. So, in this proposal we assumed that timelines should be constructed through automatic methods, with basic emotions, and the user may subsequently change them if not in agreement with the automatic result, changing it to any other emotion available in the system. This procedure is however not included in this work. But when we ask users to classify a movie as a whole, it is their final and global appreciation, which can be different from the one obtained from the automatically generated timeline.

Concerning interface design guidelines, we have based our design choices in usability heuristics, especially those concerning an aesthetic and minimalist design, familiarity and low cognitive workload, with the aim to design an interactive system that users would find useful, satisfying, easy to use and perceptive. We also wanted users' affective assessment of the interface in order to evaluate its fun, engagement and motivation factors. Thus, we performed two user interface studies. The first study was fully described in [29]. The system proposed in this paper incorporate the changes identified by the usability study, addresses some of the problems identified in the results of our first evaluation, exploring the visual representation of huge amounts of movies, extended selecting and browsing methods based on more sophisticated filters and searches. On both cases, we created many user interface elements for representing emotions in different functions and meanings. Thus, they can represent, among others, the dominant emotion in a movie, the movie emotional timeline, a set of emotional scenes in a movie and users' emotional profiles. These representations were inspired in the different representations of emotions used in the emotional models we reviewed. Also, on both cases, we have adopted round shapes and circular organizations inspired by the Geneve Emotion Wheel (GEW) [19], organized by valence and arousal. In fact, we were also inspired by the work of Norman (2004) [24], and used rounded shapes and smooth or symmetrical objects, as some of the interface characteristics that may induce positive states. Regarding the "funology" of our system, we intended to provide some additional features hoping that users would find them enjoyable, inspired by the statement of Schneiderman (2004) [25] that users should be more engaged and pushing affect and emotions with fun features, which he

considered to be: alluring metaphors, compelling content and attractive graphics. Based on these assumptions, we decided to use the album metaphor as the preferred way of organizing the videos, given that the album is the traditional means where people collect personal and favorite photos, and people, thus, tend to develop an affective connection with it.

IV. USABILITY STUDY

Based in the USE usability measures and questionnaire [26], the main objectives of the evaluation of iFelt, include evaluating the following properties:

- Usefulness - How useful can the exploration of emotional information be? Which are the best ways to access the information? Were the results provided by the system perceived as useful?
- Satisfaction – Do users find iFelt fun to use? Do users have a good experience using it?
- Ease of use: Do users find iFelt easy to use?
- Perceptiveness of the information provided by the system, as a supplement to the satisfaction and ease of use dimensions of this USE usability analysis. The questions: *Is the information representation easy to understand?* and *Which was the best way to understand the information?* were asked for this purpose.

A parallel objective was to determine if users had specific and global comments and suggestions in what concerns functionalities, access mechanisms or information representation alternatives to propose. It was a task-oriented evaluation, where errors, hesitations and timings were observed. In the end of each task, users were confronted with USE-based questions, to be answered with a five point Likert scale, and the opportunity to provide qualitative feedback through comments and suggestions for the iFelt features involved in that task. For this study, we recruited 10 computer literate subjects (6 female, 4 male) between 21-56 year old, to perform the tests of the system, as 10 participants permits to detect more than 90% of the usability problems of a user interface [26]. From this study, our first conclusion based on users' feedback is that iFelt is perceived as useful, satisfactory and easy to use in general, but there were some problems [29] regarding the interface that lead us to a new version of the system. In the next section we present the set of modifications.

V. INTERFACE MODIFICATIONS

We now proceed to present an interface based on a usability study [29] of the first version of the system (see figure 1) regarding the exploration of emotions on movies, the users that watched those movies, and the mechanisms to search and find as well as the recommendation strategies.. In this section, we first itemize the features that, in our opinion, had to be changed in order to improve the weaknesses identified in the first prototype, and then we describe the design, development and evaluation of a set of new functionalities based on the main goals we set for such a system. The following are the representations and functionalities we have changed due to the first usability evaluation results, our own observations and participants' suggestions include the following:

1) In the first interface we had two ways to find movies based on emotions, a standard title list, and a wheel of emotions (see figure 1). The first study's participants opted to use the movie title list in 80% of the cases when they wanted to find movies by its general information and 90% resorted to the wheel when they wanted to find an emotion. As we are exploring movies by emotions, we tried to create a more effective search mechanism that could provide more engaging results information and that's why we have created a new mechanism for this exploration, explained in section *Movie Search and Access by Emotions.*

2) We also observed that users felt that there was no easy way to browse into the wheel; while looking at the list they could sense there was access to a much larger number of movies. This happened because in this first prototype we did not design a filtered searching mechanism.

3) Given that the movie dominant emotion representation (accomplished through a colored circle preceding the movie titles in the Title List) was not very satisfactory, we decided to include a label in every page on this second user interface.

4) The first study's participants also had enormous difficulties in understanding the concept of the emotional scenes by the timeline feature, but found it nevertheless very interesting to enable them to compare emotions. Thus, we changed the way we present information (time and labels) in the timeline design, and created a mechanism for its exploration that turns emotional scenes more perceptive and clear and, at the same time, may create a more engaging functionality (see Figure 4).

5) The first study's users could not decide whether the movie they were exploring was already part of their personal albums. We thus created and opted to use a specific symbol to provide such visual feedback.

6) A main suggestion provided by all users of the first study was to be able to share the emotional information with other users, and the preferred functionality for them was to compare their emotions with other users. Therefore, such a mechanism has been created for this second user interface.

Taking into account these recommendations and the results of the previous usability evaluation we then developed a new interface, with a new design and new features that, in our opinion, resulted in a more comprehensive system for the purpose of exploring movies by emotions.

Regarding the graphical design of our two proposals we decided to change from a dark background to a lighter one for aesthetics reasons (as shown in Figure 1). For the second user interface (see Figure 2) we developed two types of menus: global and context. The global menu, in the top of the page, allows to navigate to: 1) Movies, which is also the homepage for users; 2) Profile, which is the link to the user's profile page; 3) Neighbors, which is a link to the page where users can explore their most similar iFelt users, i.e., the users that watched the same movies and felt similar emotions; and 4)

Recommendation, which is a link to a page that recommends movies based on keywords provided by the user.

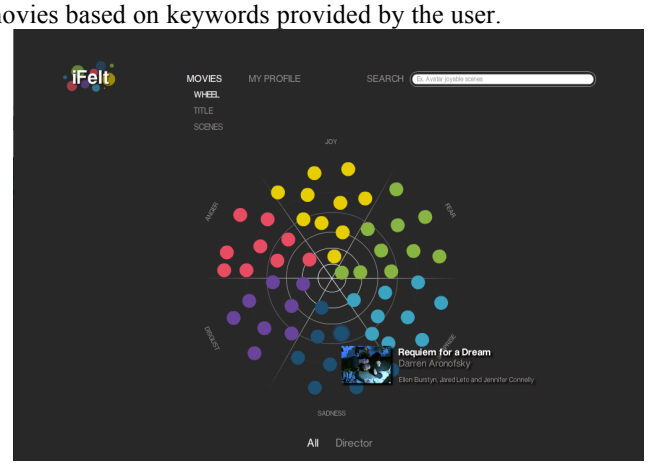

Figure 1 - First Interface Design

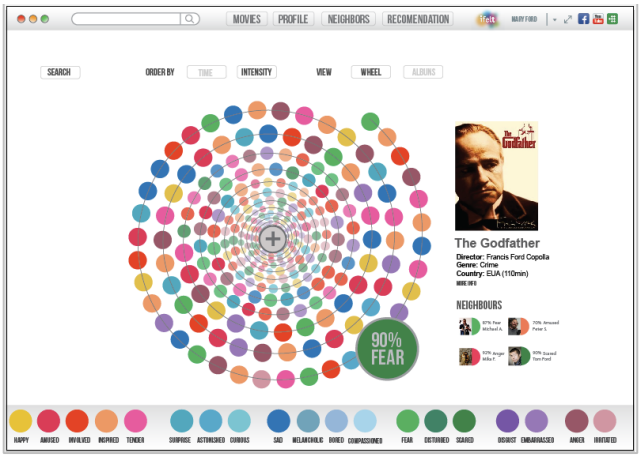

Figure 2 - Second Interface Design

The context menu appears every time the user mouse over an element of the interface with the specific commands for that element. As in the first study, we adopted a representation of emotions based on colors, like the model used by Plutchik [20]. However, in the second case, besides the basic emotions, as we described earlier, we have also used, for each main emotion, a subset of other emotions inspired from the work of Scherer [19], which in our opinion represents better an emotion triggered by a movie. We have also included these emotions after a user study conducted to learn about emotional impact of movie watching [28]. To represent the subset of emotions we used variations of the color, which corresponds to the main associated emotion (Figure 2). This information is now systematically presented in every page of the new interface.

A. Individual Movie

In the new interface, the emotional timeline is represented in a different way due to usability problems regarding the perception of the emotions (see Figure 3). We have decided to introduce a mechanism where on mouse over the emotion label appears, besides the emotional labels that are always present. We also designed a timer along the timeline that visually indicates the time of the various scenes that compose a movie. Moreover, we decided to have a second timeline below the user's timeline to enable us to represent the most similar neighbor who has watched the current movie being displayed.

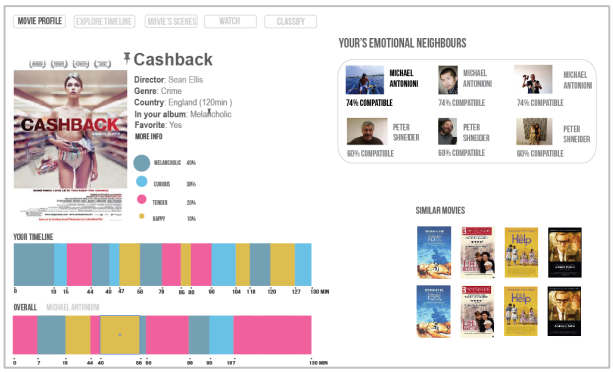

Figure 3 - iFelt emotional timeline

If for example there are no neighbors that have watched the movie, then the overall classification will appear instead. In fact, there is always the possibility of changing the view to the overall timeline. In complement, some new features were also added to the second interface to contemplate a broader set of emotional information and functionalities, such as the following:

- A list of user's neighbors that also watched the current movie. Whenever the cursor is over a neighbor, his timeline appears under the user's timeline (if the user already watched the movie), or the overall timeline is displayed instead (if the user did not watch the current movie). This feature provides the user with information about the sequence of emotions felt by neighbors in that particular movie. The concept of neighbors and compatibility was thoroughly explained above.
- The Explore timeline allows the user to explore movies by using mouse over and clicking actions, providing the possibility of viewing the respective movie scene. For example, the user has the possibility of viewing the sequence of emotions felt and watch the corresponding movie scenes by further clicking on them. It is also possible to have two timelines displayed at the same time. For example, we may want to compare our most compatible neighbor timeline with our own timeline. In our opinion, this is especially useful to enable users to gain a more accurate insight about the similarity of that neighbor (see an example of such a comparison in Figure 4).
- The "Explore Movie Scenes" feature allows users to observe a non-sequential representation of the movie along with information about how many emotions were felt for each category with their corresponding intensity, beyond being able to watch those scenes. For each emotional scene represented by a circle, its size represents its dominance (as depicted in Figure 5).
- In this proposal, we also provided a new share possibility suggested by the first study's participants. For this purpose, we included in every page header the possibility of sharing emotion's classification by clicking in icons representing the most common social sharing services for movies (as illustrated in Figure 2).

Figure 4 - Exploring timeline

- The manual classification of movies is also a new feature that we included in this functional prototype. This feature allows users to provide a manual classification of the emotion and its intensity (as shown in Figure 6). To classify movies, users are presented with a wheel, similar to the search wheel of emotions. Users then choose an emotion and its intensity by specifying the size of the circle, or by scrolling through an intensity measure. In Figure 6 we present an example of the classification of the movie "Cashback" with "curious", and an intensity of 30%, as the main emotion felt for this movie. The scroll user interface element allows for specifying the percentage of that emotion's intensity, and the circle that corresponds to that percentage is highlighted automatically. This can also be accomplished the other way round, i.e., the user may choose a circle and the scroll position is automatically moved accordingly. Users must classify each movie with a minimum of two and a maximum of five emotions.

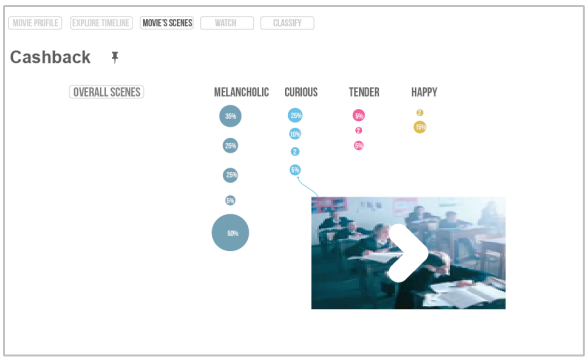

Figure 5 - iFelt scene exploration

B. *Movie Search and Access by Emotions*

In this proposal we designed a novel interactive mechanism to search, access and find movies in our experimental system. Besides the typical search keywords, that we continue to provide, we describe below the remainder mechanisms we introduced. The SWE is based in the Geneve Emotional Wheel (GEW) [19] and in studies around the wheel such as the ones reported by Caicedo & van Beuzekom [27]. The SWE serves two main purposes: a) to search, and b) to classify movies (as shown in Figure 5).

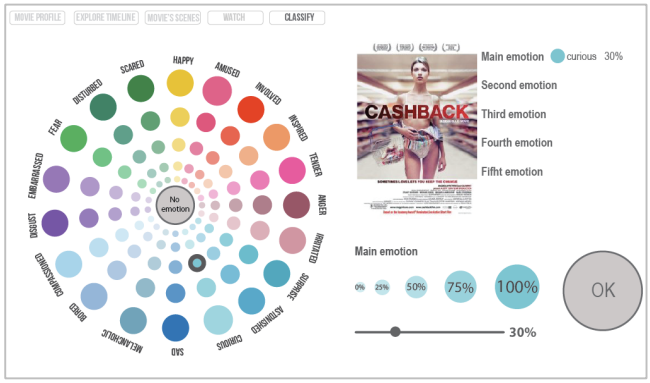

Figure 6 - Movie manual classification mechanism

As in GEW, we have a set of emotions organized in four dimensions, negative and positive, calm and excited. Each emotion is represented with a color, and the circles that become smaller and less intensive represent the level of intensity a user can search for or classify. There is also the possibility of classifying a movie with no emotion or with another emotion (outside our list), but we did not explore these two additional options in this prototype. To search through the wheel, users may select the circles corresponding to the emotion they wish to find, specifying a maximum of two emotions. The result can be displayed as a wheel or as a list sorted by time or by intensity, according to the user's preferences. Figure 7 shows an example of a time ordered wheel that represents a sample search for "amused" plus "curious" emotions. When users want to search for a set of emotions existing on movies, they may select the circle representing the emotion of the correspondent intensity. The movies represented in the wheel shown in Figure 7 are exactly the movies that were classified as "amused" or "curious" as both the main and the secondary emotion.

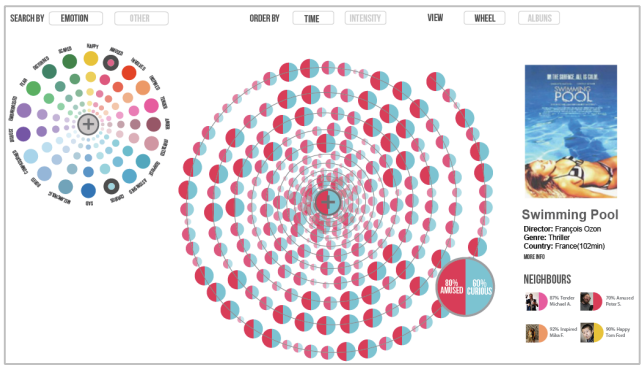

Figure 7 - Search wheel of emotions (SWE) based on GEW.

C. *Browsing Large Quantities of Movies from an Affective Perspective*

For this purpose, we created a new interactive mechanism, the movie space wheel (MSW) of emotions already presented in Figure 8. The MSW is capable of representing hundreds of movies in a limited display space and enables users to browse among an even larger number of movies by clicking in the plus signal provided for this purpose. Next to the MSW, we also display a scale (a timeline as shown in Figure 8) where users can observe the depth of the search for time or intensity purposes.

When users move the cursor over a circle, a summary of the information related with that particular movie is then displayed.

Figure 8 - Movie space wheel reaction to click on the happy circle of the SWE

D. Browsing and Accessing Movies by Exploring Neighbors

A new feature created in this version, was the exploration of movies based in neighbors. As neighbors represent the most similar users, there is a great amount of information readily available to find and access movies. In this second prototype, we propose to find and access the list of neighbors by accessing the neighbors' page (an example of which is shown in Figure 9). We thus developed a feature to find neighbors and to display their own lists. In this case, when the cursor is over a circle, it then becomes highlighted, and the number of neighbors that correspond to that particular emotion appears in the middle of the inside circle, along with additional information about the percentage of compatibility. When the mouse is clicked, the list of neighbors reacts accordingly and displays a list corresponding only to that emotion.

E. Recommendation Feature Based on Neighbors

The purpose of this feature is either to recommend movies based on emotions or based on a specific movie (see Figure 9). In the first case, we provide the general search mechanism already described above. On recommending movies based on a specific movie emotion, we provide the option to ask the system to suggest films emotionally similar to a specific one by using common information about movies such as its title, director, actors, year or country. For example, let's suppose a user wishes to watch movies similar to "Kill Bill", which in our system is classified as 70% Amused, 20% Curious and 10% Disgust. The system will first search the neighbors' profiles for movies with the dominant emotion "Amused", second emotion "Curious" and third "Disgust". Then it would query the iFelt movies' database for movies that have a similar classification. For example, Figure 10 shows the result of a recommendation issued for movies similar to "American Psycho". As shown, the system presents a set of emotions related to this movie.

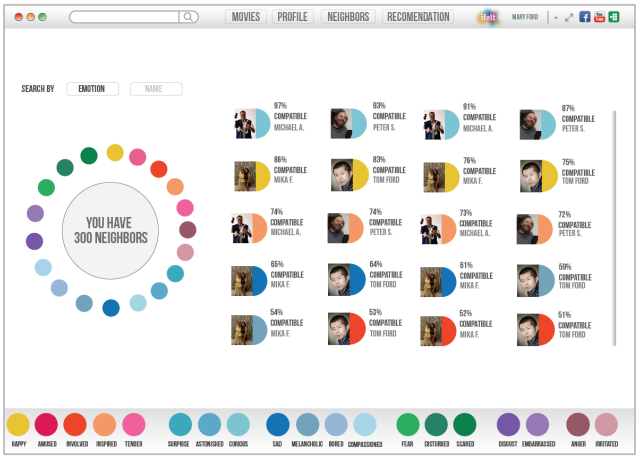

Figure 9 - Neighbors search by emotion or by name

If the user clicks on a circle representing an emotion (in this example "curious") a list of movies classified with that particular main emotion is then displayed. Moreover, when the cursor is over a circle (as shown in Figure 10 over "Curious"), the system displays a sidebar with that movie information; an emotional abstract is also listed along with the neighbor and the emotion felt by that neighbor. This feature provides access to emotional information about movies that the user didn't yet watch.

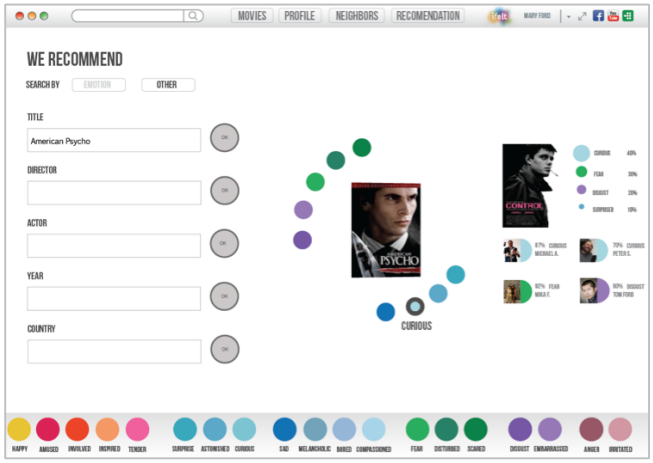

Figure 10 – Result of an emotional movie recommendation by movie title

CONCLUSION

In this work we uncovered that, until the present, there has been an absence of works, to our best knowledge, about the visual exploration of emotions conveyed on movies based on the automatic emotion recognition from users or, in other words, using the users' emotional impact. This work also uncovered that, regarding the emotion-based access and navigation of movie collections users thought it was useful to browse and explore the movie collections with a spatial order. Besides, the engagement and fun associated with the emotional exploration of movies by scenes, and the comparison with other users, probably helped participants to understand the whole concept underneath the interface. In what concerns the visual representation of emotions and system features, we are already implementing the second interface and the next step would be to

improve and extend the system we described to include a number of additional features, including: extending the concept of video summaries to present movies in chosen emotional perspectives and preferences enriching the system with additional search criteria other than just selecting scenes with one chosen emotion; summarizing, searching or recommending movies based on users current emotional states or other previously defined emotional criteria; to enable finding movies by example, with emotional timelines similar to the timeline of a given movie. Although this area stills need more research and it is yet uncommon, we think with this work we can contribute to future approaches for emotional content representation.

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