# The Interactive and Multi-protagonist Film:
# A Hypermovie on DVD

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**Abstract.** The interactive and multi-protagonist (IMP) film is a novel concept that extends the hypermovie genre. The IMP film is based on the common structures of linear narrative storytelling and provides the viewer with various decision points within the evolving story that support an active choice among different protagonists' views. The viewer will thus be elevated to the role of a decision maker. They individually and actively determine the story flow. The IMP film substantially extends the currently offered interactivity of DVDs which is primarily limited to navigation. The production process of an IMP film will be illustrated by presenting *Deine Wahrheit* (Your Truth), a DVD-based movie. The results of an empirical study support the advantages of the IMP film compared to a traditional single-protagonist version of the film. The potential of the IMP film as a new genre in hypermovie will be discussed.

## 1    Introduction

People have a natural and intrinsic ambition to broaden their knowledge and to enhance their abilities [1]. This motivation energizes behaviour with regard to acquisition of specific skills, as well as it supports explorative behaviour per se. In social contexts, for example, actively gathering as much information as possible is extremely functional. Exploring other peoples' points of view reduces the likelihood of misinterpreting human behaviour. Exploratory behaviour needs curiosity as a motivational prerequisite, and both curiosity and exploration depend on environmental conditions [2]. The key principle is to establish and maintain an optimal amount of incongruence. Perceptions of a discrepancy between present cognitive structures and environmental conditions may lead the viewer to experience a given situation as novel, entertaining or challenging. The issue of incongruence and motivation is already important in current extensions of interaction design, specifically experience design [3; 4]. Various forms of interactive or participatory narrative concepts [5] were used to attract and maintain the attention of users or viewers.

The tendency of humans to gather information by exploring different points of view is also addressed in numerous movies, for example in *Citizen Kane*; a movie masterpiece directed and co-written by Orson Welles in 1941. Welles introduced a novel concept in movie storytelling, in which the story evolved in a series of

flashbacks. Each flashback sequence's narrator was different, and they presented their subjective point of view concerning the main character in the plot.[1] Moreover, the movie did not transport any "final truth" – it was totally up to the viewer to interpret the chain of events. *Citizen Kane* conforms to traditional storytelling methods, however, in that the different views were always presented in predetermined succession and, thus, the viewers' role was "passive".

In this paper, we will describe *Deine Wahrheit* (Your Truth), an experimental interactive and multi-protagonist (IMP) film on DVD that uses a multiple points of view approach. By carefully integrating the interactive elements within the evolving story, the IMP film enables the viewer to choose actively among different competing views at various key points, thus extending structural and functional aspects of the DVD as a hypermedium. However, *Deine Wahrheit* does not deviate from common structures of linear narrative storytelling.

The IMP film, as a hypermovie, stems from the concepts of hypermedia [6] and hyperfiction [7; 8]. The basic principles of hypermedia and hyperfiction have already been realised in various forms of digital or interactive television. These productions have failed as successful commercial products due to various technical inadequacies (e.g., missing or deficient feedback channels), as well as the unavailability of new marketing and distribution strategies (e.g., Video-on-Demand (VoD)).

The DVD is technically predestined to be used as a medium for interactive and multi-protagonist films. The general availability of DVDs on the consumer market creates an opportunity for easy accessibility for hyperfilms.[2] It is possible that the DVD-based hyperfilms will corner a market alongside the already established interactive gaming industry. To date there are few conclusive empirical studies which address the effects of hyperfilms on the viewer's motivation. The present study considers these effects.

## 2    Interactivity and DVD as a Hypermedium

DVD was initially developed as a mass storage device: principally for high-quality digital video information. It also offers a potential for a wide range of interactivity. The implementation of interactivity on present DVD productions is often limited to navigational functions (e.g., chapter selection). These functions are in principle the same options offered in the outdated analogue videotapes. The DVD's interactive menus offer unique opportunities for the viewer to participate individually and actively in the navigation of the narration.

Technically these menus are implemented as so-called sub-picture overlays. These overlays can be positioned anywhere on top of any screenshot throughout the film. In the project *Deine Wahrheit* we tested whether adding an additional interactive navigational level (choosing between protagonists' views in the DVD menu) to the currently used function level positively influenced the viewer's media experiences.

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[1] To describe a narrative that presents a plotline in multiple versions, Murray [5] suggested the term *multiform story.*

[2] Tua [9] lists other possible concepts for hyperfilms.

## 3    Production of the Interactive and Multi-protagonist Film *Deine Wahrheit*

From the outset, the rise of new media was accompanied by the desire for the inter-active aspects in the medium of film [10]. Attempts to establish interactivity in film and cinema benefited from the rapid development of digital technology. The *Future Cinema* exhibition at the ZKM, Karlsruhe [http://www.zkm.de/futurecinema/ Access May 27 2004], offered numerous contemporary, as well as visionary, approaches in the field of interactivity in new media.

*Three Angry Men*, an augmented reality (AR) environment developed by Mac-Intyre and his colleagues [11], follows the setting of a jury trial in the Hollywood classic *Twelve Angry Men* (USA, 1957). In *Three Angry Men* users may choose among different competing levels that all share the common timeline of a fixed plot. Within the AR environment, the viewer "occupies" one of the virtual characters that were added to a physical room. The viewer may follow conversations between the characters, but also hears the thoughts of his present virtual character. Changing characters supports the active gathering of information and, thus, enables the viewer to develop a better understanding for the other characters' points of view. Another system that used the multiple viewpoint approach within an AR environment was proposed by Mazalek, Davenport, and Ishii [12].

In the present paper we describe a DVD-based implementation of interactive elements in the film that support an active choice among different protagonists' views.

### 3.1    Requirements Analysis

In an extensive analysis process prior realization of an IMP film, we identified the critical requirements in navigation, technical aspects, as well as the narrative parameters.

The final product should allow the viewer great latitude in making their own choices throughout the film. At the same time, the viewer should be given as little guidance as possible. However, it had to be ensured that they would always have an idea of the approximate length of the entire film. Decisions that lead to dead-ends had to be avoided. The film should reach a high external validity and therewith acquire the standard TV movie qualities in visual elements, sound and narrative content. In addition, redundancies had to be avoided, so that repeated viewings of the film, in a different order, should still be as interesting as the initial viewing. Most important, the interactive elements had to be implemented in such a manner that a relatively direct transport of contents is assured. All distractions from the contents, such as noticing the presence of the media being used, should be avoided.

In the IMP film *Deine Wahrheit* the interactive elements were integrated as cyclic elements within the story (i.e., leaving an apartment). The viewer's interactions step in the story at the end of each episode which represents a natural transition to the next chapter. Gansing [10] stresses the importance of deliberately designing the interactive elements in the film genre for the viewers' actions:

*"(...) we cannot ignore the importance of interaction design as it enters into dialogue with narrative structures. Just as stylistic conven-*

*tions regulate narrative understanding, interaction design regulates possible actions."* [10, p.40]

### 3.2 Concept

The basis of the IMP film *Deine Wahrheit* is a uniform story that is narrated independent of the viewer's interaction. Their natural motivation for gathering new information should be supported by the implementation of interactive elements, without directly influencing the story line, and still keeping the linear character of a feature film.

The use of different camera filters is an important technique in film-making. Filters are chosen selectively to affect the viewer's impression of an ongoing story. The filter technique was adopted for the multiple viewpoint approach in the IMP film. Each view presented in *Deine Wahrheit* represented a filter to the story. The view-filter analogy is supported by findings from cognitive psychology that filters affect human perception. This is due to the fact that human perception is the result of complex and interdependent processes that are mediated by characteristics of the perceiving subject (for a review see [13]). Among other things, individual characteristics include attitudes, feelings, and knowledge. These characteristics, however, are subject to the continuous flow of information. Thus, what is thought to be "true" may change with additional perceptions. The interactive key points in the IMP film *Deine Wahrheit* serve as an interface, or filter, that enable the viewer to choose actively among competing subjective perceptions of the same events. By way of reflecting the perceived events, a deeper understanding for the story and the acting characters evolves. The viewer will thus be elevated to the role of an active decision maker. Lastly they need to realize that they are responsible for the interpretation of the story.

The story of the IMP film *Deine Wahrheit* splits into five chapters. Prior to each chapter, a menu with a choice of five different perspectives from which to watch the following chapter is displayed. Overall the film can thus be watched in five to the fifth (3125) different ways. It could also be entirely watched from only one perspective (ongoing), without considering any of the other four. Figure 1 illustrates the structure of the IMP film.
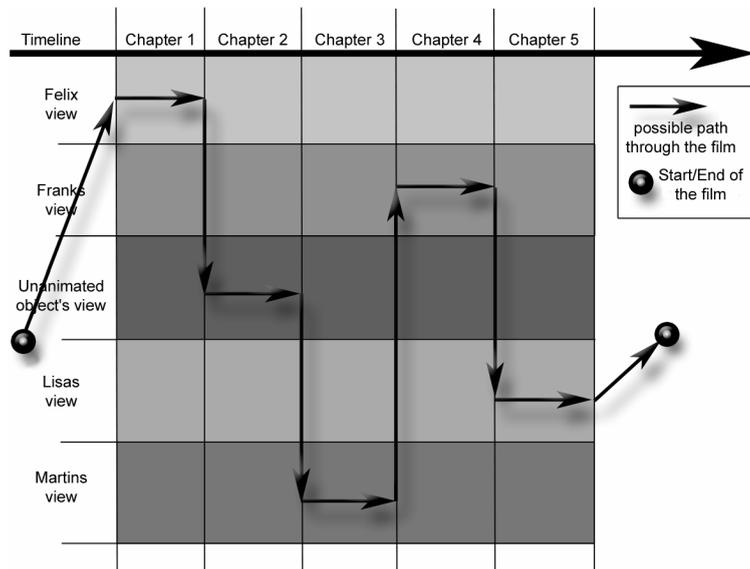
**Fig. 1.** The structure of the IMP film *Deine Wahrheit*

### 3.3    Story, Main Characters, and Script

*Deine Wahrheit* depicts a type of crime story, regarding the missing main character Tracy. Tracy's brother is accompanied by the viewer while looking for an explanation for his disappearance. The key is that the viewer decides which person from Tracy's surroundings the brother will meet and will describe the events, which will be shown in flashbacks, of the individual chapters. Together, at the end of each chapter, the viewer and Tracy's brother leave the person's place, and again a perspective will be chosen for the chapter thereafter. In doing so the viewer is taking the place of the brother and will make a choice on his notebook (see Fig. 2).

Out of the various mentioned concepts, most of the importance, in the conception and forming of the IMP film's script and story, was put on the authenticity of the dialog and presentation of the film characters. The main character Tracy is the centre of the story. The different characters, such as his two friends Felix and Martin, his counterpart Frank, and his girlfriend Lisa, form a circle of various perspectives around him. In addition to the four characters' view there was an unanimated object's view called Tracy's apartment (*Tracy's Wohnung*). In each of the five perspectives a certain, and each time a different, aspect on Tracy's personality is brought to the light (see Fig. 3). The previously invented personalities, such as the motivations and emotions, of the characters were then combined with the situations in the story to form the scenes and dialogs of the script.
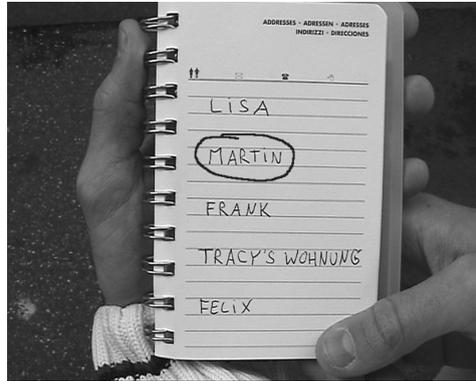
**Fig. 2.** Interaction menu in the IMP film *Deine Wahrheit*: Choosing the protagonist's view
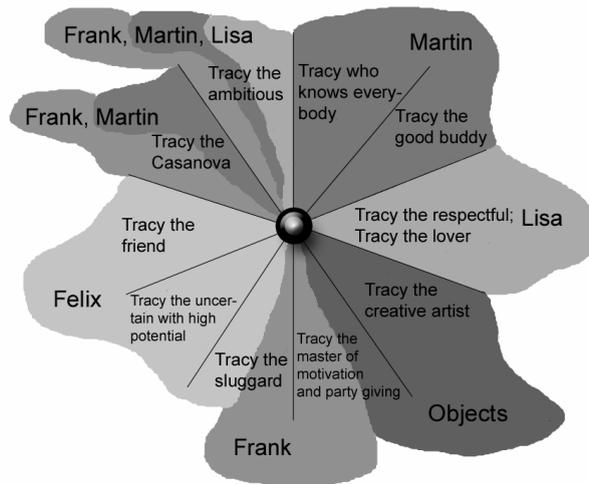


**Fig. 3.** The main character Tracy in the view of the sub characters

### 3.4 Film-Shooting, Editing, Post-Production, and DVD-Authoring

Due to the complexity of the project and the planning of the film-shooting, it was essential to create a database for the efficient scheduling of the scenes, the roles, and availability of the actors. The film was shot with Sony Mini-DV cameras. Sound was recorded with an external microphone onto DAT-tapes.

The 25 film episodes (an episode is a chapter covering a certain perspective) vary in lengths between eight and thirteen minutes each. After the editing and post production, the parts of the film were exported and converted into MPEG-II format.

Consumer DVD-burners are currently limited to CDs with the smallest capacity (DVD-5). For an average video data rate of 3.5mbits, the film had to be divided up onto two DVDs. This requires the viewer to switch DVDs half way throughout the film and they will therewith be taken back down to the user's level. However, any reduction of the film's length, or picture and sound quality would have resulted in a greater distraction from the reception of the film.

For the storyboard the sublevel menus after each chapter should not be realized by the viewer to be a direct interaction. They were hence integrated into the film in a manner that suits the normal course of the story. After the selection of a perspective for the following chapter, the film continues at the same spot at which it was actually interrupted (see Fig. 4).
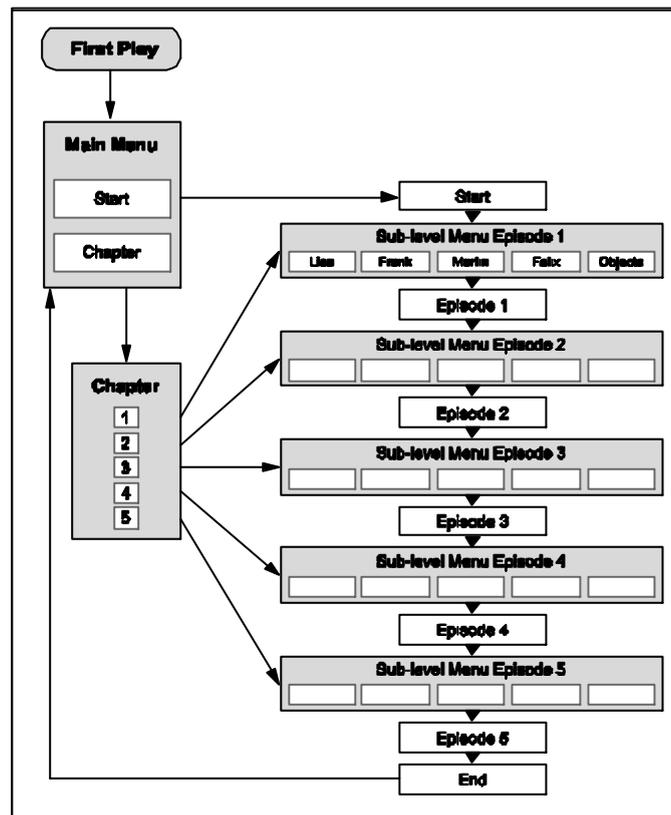


**Fig. 4.** The storyboard of the IMP film *Deine Wahrheit*

## 4    Empirical Evaluation

Do viewers of an IMP film differ from viewers of a traditional film in terms of their film ratings? What are the specific advantages of the IMP film? To address these questions, 28 participants were invited to watch the IMP film *Deine Wahrheit* on DVD under single testing conditions. On each of three consecutive trials, the whole film was shown on a PC or notebook. Prior testing, participants were randomly assigned one of two groups. Members of the first group (subsequently referred to as *interactive condition*) were told to switch between points of view at the beginning of each chapter as often as possible. They were given no further specifications. For the second group (subsequently referred to as *linear condition*), the presented point of view was fixed within each trial, but differed between trials. Thus, participants in the linear condition watched a traditional multiple point of view version of the IMP film, with different views being presented in succession.

Following the third trial the participants were given a questionnaire with 19 items that concluded the evaluation (see Appendix). In the interactive condition there were eight additional items to evaluate the navigation and interactivity in the IMP film.

### 4.1    Results

For each item, participants' ratings were recorded on a four-point scale, ranging from 1 (*"I don't agree at all"*) to 4 (*"I totally agree"*). The following details represent mean group ratings that were further analyzed by means of unpaired *t*-tests ($df = 26$, a $= .05$).

Substantial group differences were observed in the ratings of the questionnaire. Though mean ratings were on a high level in both conditions, indicating that most participants liked *Deine Wahrheit*, there was a significant advantage for the interactive condition ($M = 3.71$) compared to the linear condition ($M = 3.07$; $t = 3.11$).

The IMP film also seems to be important for viewers' feelings of familiarity with the different characters shown in the film. In the interactive condition ($M = 3.07$), participants agreed more strongly to the fact that they felt familiar with film characters in a way similar to characters in well-known TV series ($M = 2.50$, for the linear condition; $t = 2.66$).

In spite of the repetitive events in the film, participants in both conditions welcomed the availability of different points of view. Interestingly, ratings in the linear condition ($M = 3.64$) significantly surpassed those of the interactive condition ($M = 3.21$), for the respective item ($t = 2.10$). Participants in the linear condition ($M = 3.50$) also tended to miss more strongly the availability of all points of view or episodes in the film ($M = 3.00$, for the interactive version of the IMP film; $t = 1.84$, $p = .08$).

For the interactive condition, participants strongly agreed to the item that the concept of interactivity had been successfully implemented in the navigational structure of the DVD ($M = 3.79$). The ratings also indicated that the IMP film neither offered too few ($M = 2.07$), nor too many ($M = 1.43$), key points to choose among different competing views.

## 4.2    Discussion

The comparison of the two versions of the film revealed that participants favoured the additional interactive elements in the IMP film that supported an active choice among different protagonists' views. In addition, using these elements was simple and not confusing.

Viewers of the interactive version of the IMP film reported an outstanding feeling of familiarity with the characters shown in the film. This finding illustrates one of the IMP film's major advantages; it seems especially suited to induce a deep understanding of the different acting characters. We interpret this result as evidence that, by adding interactive elements to a popular hypermedium, the natural tendency of humans to gather information actively may be successfully supported.

## 5    Conclusion and Future Research

*Deine Wahrheit,* an example of a DVD-based IMP film, reflects and extends current trends in media. The IMP film follows common structures of linear narrative storytelling, but offers an additional interactive navigational level to the currently used function level of the DVD as a hypermedium. The IMP film integrates the concepts of hyperfiction [7; 8], participatory narration [5], and experience design [3; 4].

Various interaction points that were carefully implemented within the evolving story of the IMP film support the active role of viewers. Choosing among different protagonists' viewss enables the viewer to determine individually and actively their information flow. The IMP film, thus, follows the notion of interactivity in digital media as a way of externalising mental processes [14].

In this paper, we have demonstrated that the DVD-based IMP film successfully contributes to entertainment computing. The IMP film provides the viewer with an interactive basis that supports their natural motivation to gather additional information. To choose among different competing views is found attractive and challenging, and, eventually, helps to make complex human behaviour more transparent. It is assumed that the DVD-based hyperfilms will corner a market alongside other forms of interactive media, specifically the already established gaming industry.

An additional concept for the IMP film is the multi-viewpoint film like discussed during the introduction of high-performance graphic boards for PCs. These systems allow for different spatial viewpoints via realtime rendering of cinematic sequences of computer animations. The concept has been called *cinematic computing* [15]. This method might be used in future mainly digitally produced films together with the IMP film concepts described in this paper. Multiple spatial viewpoints combined with multiple story threads can be expected to be extremely entertaining for an active audience looking for an interactive narration-based visual experience.

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**Appendix**

**Table 1.** Items used in the questionnaire during the empirical evaluation of the IMP film *Deine Wahrheit,* together with mean group ratings (*M*) and standard deviations (*SD*) in the *interactive* and *linear* condition.

| Would you agree that | interactive M | interactive SD | linear M | linear SD |
|---|---|---|---|---|
| 1 ...you liked the movie? | 3.36 | 0.74 | 3.14 | 0.36 |
| 2 ...the characters of the film were authentic? | 3.07 | 0.62 | 3.00 | 0.39 |
| 3 …the story was credible? | 2.93 | 0.62 | 3.00 | 0.55 |
| 4 …you always knew where you were in the course of the story? | 2.79 | 0.80 | 2.64 | 0.74 |
| 5 …the story was comprehensible? | 3.07 | 0.27 | 3.36 | 0.50 |
| 6 …you regret not having been able to see all parts of the film? | 3.00 | 0.88 | 3.50 | 0.52 |
| 7 ...your impressions of the events in the film deepened after the | 2.71 | 0.47 | 2.54 | 0.52 |

| *Would you agree that* | interactive | | linear | |
|---|---|---|---|---|
| | *M* | *SD* | *M* | SD |
| reruns? | | | | |
| 8 …you liked the form of presentation (choosing among the protagonists' views within the story vs. different narrators between trials)? | 3.71 | 0.47 | 3.07 | 0.62 |
| 9 ...you would prefer another form of presentation (only one narrator's view per trial vs. choosing among the protagonists' views within the story)? | 1.86 | 0.53 | 2.29 | 0.99 |
| 10 ...you were bored because of the constantly repeating events? | 2.07 | 0.83 | 1.79 | 0.58 |
| 11 ...it was the small but important differences between repetitions that made it interesting to watch the film again? | 3.21 | 0.56 | 3.64 | 0.48 |
| 12 ...the different protagonists' views complemented well? | 3.21 | 0.58 | 3.14 | 0.53 |
| 13 ...you became familiar with the film characters in a way similar to characters in your preferred TV series? | 3.07 | 0.47 | 2.50 | 0.65 |
| 14 …you would appreciate watching the film with other people and share the responsibility for choosing among perspectives? | 2.36 | 1.15 | 2.64 | 0.63 |
| 15 …watching the film with other people would prevent you from making decisions on your own? | 2.50 | 1.16 | 2.29 | 0.61 |
| 16 ...you prefer movies that do not force you to make a decision what to view next? | 2.07 | 0.47 | 2.14 | 0.66 |
| 17 ...the presented type of film is definitely interesting and you would like to watch more of this kind? | 3.50 | 0.52 | 3.64 | 0.50 |
| 18 …movies should provide the opportunity to control the story, but without requiring a choice among different protagonists' views? | 2.79 | 0.43 | 2.86 | 0.77 |
| 19 ...movies should provide both the opportunity to control the story and to choose among different protagonists' views? | 2.79 | 0.97 | 2.86 | 1.10 |
| 20 …the navigation (names on the notepad) was easy and well integrated within the ongoing events? | 3.79 | 0.43 | | |
| 21 ...it was easy to choose a specific view for the next episode? | 2.86 | 0.95 | | |
| 22 …it was difficult to choose a specific view because you were afraid to miss important information? | 2.21 | 0.89 | | |
| 23 …you were always in total control of what is going on in the story? | 2.21 | 0.97 | | |
| 24 ...choosing among different views was annoying because the story evolves independently of your decision? | 1.71 | 0.73 | | |
| 25 …choosing one view was annoying because you felt uncertain about the goal of the story? | 1.93 | 0.73 | | |
| 26 …that there were too many decision points for choosing among the competing views? | 1.43 | 0.65 | | |
| 27 ...that there were too few decision points for choosing among the competing views? | 2.07 | 1.07 | | |