

In Göbel, St., Spierling, U., Hoffmann, A., Iurgel, I., Scheider, O., Dechau, J. & Feix, A. (Eds.), *Technologies for Interactive Digital Storytelling and Entertainment, 2nd International Conference, TIDSE 2004, Proceeding*. Berlin, Heidelberg: Springer Verlag. pp. 207-212.

## ***mediapark:*** **Presenting the Media Docks Luebeck with the Digital Storytelling System *Jeherazade***

Peter Hoffmann<sup>1</sup>, Tim Eggert<sup>2</sup>, Lia Hadley<sup>3</sup>, Michael Herczeg<sup>4</sup>

IMIS Institute for Multimedia and Interactive Systems  
Willy-Brandt-Allee 31a, Media Docks  
D-23554 Luebeck

<http://www.imis.uni-luebeck.de>

<sup>1,3,4</sup> IMIS Institute for Multimedia and Interactive Systems  
Willy-Brandt-Allee 31a, Media Docks  
D-23554 Luebeck

{hadley, herczeg}@imis.uni-luebeck.de

<sup>2</sup> IMIS Institute for Multimedia and Interactive Systems  
Willy-Brandt-Allee 31a, Media Docks  
D-23554 Luebeck  
tim@froggologic.org

**Abstract.** This article presents the first implementation results of a storytelling system called *Jeherazade*. The *Jeherazade* system is based on the idea to enhance the classical theory of Aristotle to the new form of digital storytelling. The article describes the ideas and the results of a example implementation, *mediapark*. *Mediapark* is a presentation done for demonstration purposes. It shows the functionality of *Jeherazade* and gives an idea of its future possibilities. Included to this storytelling demonstration, *mediapark* also shows the integration of a speech and dialogue based interaction API.

## **1 Introduction**

Digital storytelling is the latest step in the progression of presenting content in form of a narrative. Usually it follows the same well-known strategies similar to classical storytelling. The most frequently used strategy is the one which follows the course of suspense in a poetic story as Aristotle described it long ago. He dissects the story into four parts: exposition, ascension, climax, and conclusion [2, 8]. This idea worked as long as stories followed a linear construction and there was no interaction possible by the reader.

Since modern technologies offer readers the possibilities of interaction, as well as non-linear navigation (e.g. in information sites, web sites etc.), it is not easy to design stories with a classical course of suspense. Due to the fact that the readers can choose

their own individual way through information sites, the author has less control on how the suspense is built and, as a result, how the readers will experience “their” story. The *Jeherazade* concept uses Aristotle’s concept as a cornerstone to develop a new digital storytelling method [5].

The basic idea of *Jeherazade* is to expand the story line from linear to non-linear, or from two to at least three dimensional. So the story line becomes a story site [5, 4]. The reader is free to navigate through his story site on his own individual story paths. It would be ideal if the course of suspense of those individual story paths would follow the classical course. If non-linear navigation is used it is nearly impossible to guarantee an intense course of suspense. The reader has to be guided with hints and clues. This is the task of the storyteller. The storyteller makes suggestions at different decision points in the story about which way would bring about the most exciting developments in the story path (Figure 2).

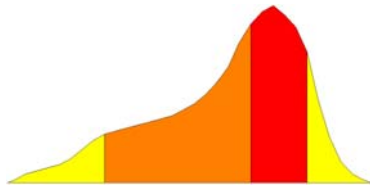


Fig. 1. Classical story line

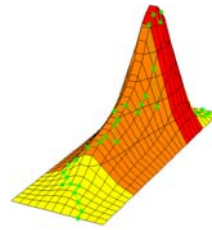


Fig. 2. Story site with a story path

## 2 *Jeherazade*

The *Jeherazade* system is an interactive digital storytelling system which is based on the idea that readers are story chasers [5, 4]. Analog to classical readers the story chasers experience narratives by choosing individual story paths in story sites. They adopt active roles in the narrative. They choose their individual story paths and meet characters who give them information, hints, and clues. This information allows them to interact with the story line by making decisions.

### 2.1 Characters & Equipment

Characters in the *Jeherazade* system have the task to present the information stored in the story site. This is the way *Jeherazade* tells the story and gives hints and clues for the forthcoming story path.

There are two kinds of characters in the *Jeherazade* system. The first one is the story chaser: this character represents the reader and is totally free to follow own individual paths through the story site. It does not present the stored information but informs the *Jeherazade* system about the story chasers actions and choices. The other kind of characters in the *Jeherazade* system are actors in the narrative: their task is to present the narrative’s content. They can be personalized characters like 2D and 3D avatars as well as abstract characters like video or audio players, text or image windows and so on [5].

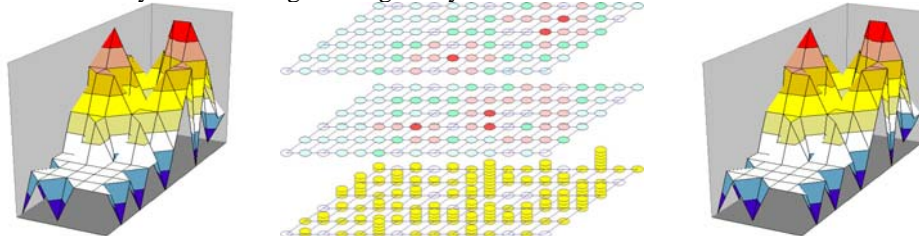
Equipment used in the *Jeherazade* system has the task of providing the interaction between the story chaser and the story site. This is the way the story chaser “tells” the story site what story path he wants to choose or what information he needs before he continues.

The equipment is also divided into two categories. The first one is the equipment which builds the environment in which the story takes place, comparable to the scene or the stage in theatre or film. The other category of equipment are interaction utilities. Presently, this kind of equipment consists of simple interaction devices (e.g. keyboard, mouse and joystick). A speech input device is also integrated into the system.

As the *Jeherazade* system has a modular software architecture, it is possible to connect new and other kinds of characters and equipment to the system easily. It is planned to integrate several kinds of sensors (e.g. light and movement) as well as an image-processing tool for the recognition of pointing gestures [7].

### 2.3 Grid Layers

In the *Jeherazade* system the content of the story is separated from interaction and presentation. It is possible to use the same information in several plots which are adapted to a special audience or target group. For example, the same text can be used by a comical character for children, as well as for a realistic character for grown-ups. To provide this idea of flexible usage of information, the content and the plot in the *Jeherazade* system is arranged in a grid layered architecture.



**Fig. 3.** Different courses of suspense for the same information site:  
yellow: i-grid layer; blue-red: s-grid layer (without sub-grids)

The lowermost grid layer is the i-grid layer (information grid layer). This layer contains the basic information which will be presented in the plot of the narrative and is stored in form of files of any format. Each nodal point in the grid layer can carry a different number of information files. This creates a flexible support for navigating in the depth of information. The position of the stored information in the i-grid layer has nothing to do with any kind of physical location in an exhibition site.

The ec-grid layer (equipment & character grid layer) is arranged separately. This layer defines, which equipment and characters are available for interaction and presentation of the story’s content. It only defines the default settings for each piece of equipment and character on the story site. More specified settings are designated in other grid layers.

The story plot is designed in the s-grid layers (suspense grid layers). The number of s-grid layers on a story site depends on how many different target groups exist. An

s-grid layer itself consists of two sub grid layers: the s-ec-grid layer and the s-s-grid layer.

The s-ec-grid layer gives the specifications for the settings of the equipment and characters defined in the ec-grid layer to give characters and equipment their final shape (appearance) and behavior adopted to the specific target group.

Even more important is the s-s-grid layer. In this sub grid layer the suspense is specified in reference to the information and the specific target group. The information itself is neutral and offers no suspense: it is only as suspenseful as the amount of interest awakened in the target group.

## 2.4 Storyteller

A character's behavior and appearance, the equipment, and the various grid layers of information are used for presentation, interaction, design of the story grid site, and exploring individual story paths. To tell a real story, a core is needed in form of a storyteller. This is the task of *Jeherazade*. It gives the story chasers hints and clues where to go next to experience a suspenseful story. *Jeherazade* encourages the story chaser to follow a certain story path; it doesn't prevent the story chaser though from choosing any path e.g. by hiding options of possible ways. It only gives hints if one choice at a decision node "fits" in the course of suspense better in that particular chosen story path.

## 3 The *Mediapark* Presentation

The *mediapark* presentation is the first presentation derived from the *Jeherazade* system. It is designed to demonstrate *Jeherazade*'s functionality and the simplicity of implementing the concept.



**Fig. 4.** Comic-figure avatars, representing likeness of IMIS staff, guide through the media docks and the IMIS Institute.

The media docks, which is the home of the Institute for Multimedia and Interactive Systems (IMIS), is used as the scenery for this *Jeherazade* presentation. The story in the *mediapark* presentations introduces the reader to the Media Docks Luebeck and the Institute for Multimedia and Interactive Systems (IMIS). The story chaser follows an information trail through the "media docks" building and receives historical antidotes, information about its restoration, and information about present usage.

Another trail contains specific information about the Institute for Multimedia and Interactive Systems (IMIS): who works there, what research is done, which seminars are offered for the students of the University of Luebeck, etc.

### 3.1 Nonrealistic Rendering

The idea to use 2D comic figures as avatars was taken after several impressions of realistic rendered 3D avatars proved to be too artificial [1]. For example, motion and facial expressions of 3D avatars made it difficult to accept 3D avatars as realistic dialogue partners.

The figures of the comic TV series “Southpark” were used as archetypes for the 2D comic *mediapark* characters in the *Jeherazade* demonstration. Those figures are a good example for simplicity and effectiveness. They move, change their facial impressions, and talk in a manner that is easy for the reader to relate to, even though they are not natural.

### 3.2 Synchronous Speech Interaction

As the only “not basic” equipment and characters a speech and dialogue API was integrated into the present *Jeherazade* system. This API (SADi-J) supports both, speech input and speech output. Furthermore it manages dialogues between speakers.

The speech input part of the new developed API is used in the *Jeherazade* system as a piece of equipment. Its is comparable with the function of buttons in the GUI or mechanical sensors etc..

The SADi-J API extends the Java Speech API to a better handling of managing dialogues between two or more speakers. In the *Jeherazade* system this functionality is used for the possibility to speak longer dialogues in one story nodal point without burdening the storytelling core of *Jeherazade*. Such dialogues include the texts to be spoken, events for facial animation and commands for the character animation

The events (i.e. speech and dialogue) stay within the story renderer of *Jeherazade*. A dialogue gives the information at a story nodal point and defines the next story segment. This segment is atomic and can not be divided anymore.

## 4 Conclusion & Future Prospects

The *mediapark* project has two goals. The first goal of the *mediapark* demonstration was to show the feasibility of the *Jeherazade* concept. The second goal is to show the functionality of the newly developed speech and dialogue API SADi-J.

The API SADi-J extends the existing Java speech API to a dialogue managing API. The demonstration shows that SADi-J is able to handle dialogues between two and more speakers including switching the voices and emotional expressions in the voices. Even if the main focus in the development of the SADi-J API was the handling and managing the flow of speech dialogues, it also supports and integrates the functions of the Java Speech API for speech recognition. The *mediapark* demonstration showed that both sub-goals for the speech input and output were reached.

The second, even more important goal of the *mediapark* demonstration was to show the feasibility of the *Jeherazade* concept. This was accomplished by expanding the classical story line into a story site and giving the story chasers the possibility of

exploring their own individual story path. Furthermore, it shows the feasibility of the *Jeherazade* software architecture. This architecture splits the story into grid layers for the information and for the plot and the technical system with the equipment, which provides the interaction, and the characters, which present the current information, and the storytelling logic.

The *Jeherazade* system and the SADI-J API will both be extended to include new options. The concept for a museum exhibition in Castle Eutin has already been completed [5, 4]. The next step is to create an extended story site which includes the grid layers introduced above.

A challenge that has to be met is how to facilitate authors in the process of story site design [5]. They need to be provided with easily accessible and comprehensible authoring tools. For more comprehensible presentations it is planned to use XMendel, a web-based semantic web tool, developed in the Institute for Multimedia and Interactive Systems at the University of Luebeck [3, 6].

## References

1. Baptista, Alceu: Making Of Kaya. <http://www.vetorzero.com.br/kaya/kaya1.html>. 2002
2. Fuhrmann, Manfred: Die Dichtungstheorie der Antike. ISBN: 3534054695. Wissenschaftliche Buchgesellschaft, Darmstadt. (1992)
3. Hartwig, R.; Herczeg, M.; Hadley, L.: "XMendeL - A web-based semantic Web Tool for e-Learning Production Processes" In: Proceedings to ICCE 2003, Hong Kong, ISBN: 962-949-144-3, pp. 556-56
4. Hoffmann, P.; Herczeg, M.: Distributed Storytelling for Narrative in Spacious Areas. In: TIDSE, 1st International Conference on Technologies for Interactive Digital Storytelling and Entertainment (Hrsg.). Darmstadt, 24. – 26. März 2003
5. Hoffmann, P.; Herczeg, M.: Expanding the storyline. Museums and the Web 2004. 24. – 26. June 2004 (to appear)
6. Schön, I.; Hoffmann, P.; Herczeg, M.: Changes in the Production Process for E-Learning-Systems Using the Combination of Instructional and Narrative Models. In: Proceedings of the ED-Media 2003, Honolulu, Hawaii, (2003)
7. Spierling, Ulrike, Schnaider, Michael: Info zum Anfassern - der digitale Messestand. In: ZGGDV Jahresbericht 2001, Darmstadt (2001). 57 – 58
8. Staehle, U.: Theorie des Dramas. ISBN: 3150095034. Reclam, Ditzingen (1973)