

XIMPEL INTERACTIVE VIDEO – BETWEEN NARRATIVE AND GAME PLAY

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ABSTRACT

In this paper we present the XIMPEL¹ interactive video platform. XIMPEL has been developed for the Clima Futura climate game, in which we use interactive video as a basis for scenario-driven games, with additional mini-games for elaborating on specific topics or tasks that arise during game play. XIMPEL has also been deployed in education, for creating short viral videos which allow for further interactive explorations. In this paper we will discuss the relation of XIMPEL with the Clima Futura game concept(s), describe the XIMPEL Interactive Video Format, and discuss the use of scenarios and storygraphs, in particular from the perspective of what interactive cinema and games have in common. We will also look at how the interactive video format can be deployed for scoring and diagnostics to provide meaningful feedback to the user, and the role argumentation rethorics can play in structuring information and interaction.

INTRODUCTION

Nowadays more and more institutions and organisations feel compelled to be present on one of the popular websites, like youtube.com, to present their message or mission and attract the attention of a wider audience. Commonly used formats are *viral* videos or games, demanding only casual attention, and meant to seduce their audience in buying or exploring additional offerings. However as observed by Alexander et al. (2007), in their Museum on the Web 2008 article Beyond Launch: Museum Videos on YouTube², launching a video or game is one thing, but defining a communication strategy that attracts the attention of users over a longer period of time and creates a bond with potential clients is rather more demanding. Essential questions here are

- *relevance* – what is our message?
- *identity* – who are we?

¹ximpel.net

²www.archimuse.com/mw2008/papers/hart

- *impact* – why would anybody be interested?

And even more importantly, however well-meant and serious the message is, why would people pay any attention whatsoever to it, if it does not immediately arouse curiosity, and why would potential clients explore the further offering if the effort to do so is or may be seen as too demanding, given the fact that competitors are very likely one or two clicks away.

A very helpful set of criteria, summarized below, for distinguishing games from other (online) applications were presented to us in a workshop on educational games in a museum context³:

criteria

- *challenge* – relevance, feedback, confidence
- *curiosity* – cognitive or sensitive discrepancy
- *control* – contingency, choice, power
- *context* – intrinsic or extrinsic metaphor(s)

Whereas *context*, *challenge* and *control* seem to be the major parameters for modelling user actions in terms of, respectively, goals or topics and strategy and choices, or in other words scenarios with more or less well-established courses of behavior, *curiosity* seems a distinguishing factor not only for games but also for viral videos.

The notion of context may need some further elaboration, as it indicates the extent to which the game play or media format is intrinsic to the domain, that is inherently related in terms of content and metaphors, or extrinsic, that is relatively independent of the domain and available as a format that may be re-used over and over again for many different domains, as for example a memory game, simply by selecting the appropriate set of images.

Our XIMPEL Interactive Video Format resolves the tension between immediate attention and convenient exploration, by allowing viral clips to act as an interface to a rich repository of other (interactive) video material, as well as other interactive applications including scenario-based games and casual mini-games.

structure The structure of this paper is as follows. We will first discuss the relation between XIMPEL and the Clima Futura game concept(s). Then we will describe

³www.archimuse.com/mw2008/abstracts/prg_335001733.html

the XIMPEL Interactive Video Format in more detail, and discuss the use of XIMPEL in student projects *interactive multimedia* at our university. After looking at the relation between (interactive) cinema and games, we will briefly indicate how scoring is dealt with and how user navigation, that is the actual choices made by a user, may be used to provide diagnostics, for example with respect to standpoints taken in the debate on climate issues. We will then explore how argumentation rethorics can be of help in organizing (a large body of) video fragments and imposing structure on interaction. Finally, we will look at future work we plan to do for Clima Futura and draw our conclusions.

GAME CONCEPT(S)

As more fully explained in Eliens et al. (2007b), Clima Futura⁴ was explicitly meant to tackle the *pathos* of the media, of which Al Gore's *Inconvenient Truth* was only one example, and bring about a deeper, science-based awareness of the climate issue(s) with a younger audience, primarily high-school students in the age of 14-18 years old. Quoting Eliens et al. (2007b):

The Clima Futura game addresses the issues of climate change, not altogether without *pathos* nor *ethos*, but nevertheless primarily focussed on bringing the *logos* of climate change into the foreground, in other words the scientific issues that are at play, and the science-based insights and uncertainties that may govern our decisions in the political debate.

Clima Futura is a turn-based game in which the player is confronted with a series of problems and disasters, for which actions are needed to counteract the possibly fatal consequences. All player actions have effect on a score in the result parameters (*people, planet, profit*). In addition, Clima Futura features *mini-games*, that may be selected on the occurrence of a game event, to acquire additional information, gain bonus points or just for entertainment. Examples of mini-games, are *negotiation with world leaders*, or a climate-related variant of Tetris.

The game model for Clima Futura can conveniently be depicted, fig. 1, as three interwoven cycles of activity and events resulting from players' actions or occurrences within the climate simulation model, which keeps track of climate changes due to these events over (game) time.

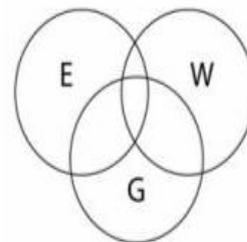


Fig 1. Game play, Simulation (W), Exploration

In summary, the Clima Futura game combines the following elements:

1. game cycle – turns in subsequent rounds (G)
2. simulation(s) – based on climate model (W)
3. exploration(s) – by means of mini-games (E)

Each of the three elements is essentially cyclic in nature, and may give rise to *game events*.

Early on in the development of the Clima Futura game concept, we decided to give interactive video a prominent place, not only in the exploration(s) supporting mini-games, but also as an interface for menu-selection and the choice of actions in response to game-events. In this paper, we will primarily focus on XIMPEL Interactive Video and only briefly indicate the game-oriented features of the XIMPEL platform in the section on future work for Clima Futura.

XIMPEL VIDEO FORMAT

In this section, we will present the basics of the XIMPEL Interactive Video Format, by presenting an example taken from the online tutorial⁵ accompanying the XIMPEL distribution. Below, in the first fragment, a declaration is given for the subject *ExpertDebate*:

```
<subject name="ExpertDebate">
<longname>
  Discussion between Dorland and Kroonenberg
</longname>
<score>2</score>
<videos>
<video file="debate-01"></video>
<video file="debate-02"></video>
<video file="debate-03">
  <question>
    Van Dorland is against mitigation
  </question>
  <rightanswer>>false</rightanswer>
</video>
<video file="debate-04">
  <question>
    Kroonenberg proposes adaptation to change
  </question>
  <rightanswer>>true</rightanswer>
</video>
```

⁴www.climafutura.nl

⁵www.cs.vu.nl/~eliens/im/local/intro-iv.pdf

```

<video file="debate-05" repeat="true">
  <branchquestion>
    Are you worried about the climate?
  </branchquestion>
</overlays>
<overlay
  position="01" label="AntiMeasures"
  position2="31" label2="ProMeasures"/>
</overlays>
</video>
</videos>
</subject>

```

A basic video configuration file defines a playlist, which consists of a number of *subjects*, containing video fragments related to that subject. Video fragments may include *questions*, which may be either transitory, allowing the user to obtain bonus points, or modal branching, giving the user the choice to switch to different *subjects*. Finally, there are *scores*, to reward the choice of particular subjects, or give bonus points for correctly answering transitory questions. To complete the example, the continuation for the choice for *ProMeasures*, during the 5th fragment of the *debate* videos, is:

```

<subject name="ProMeasures">
  <longname>
    Yes, and I want climate measures!
  </longname>
  <score>4</score>
  <videos>
    <video file="nature-01"></video>
  </videos>
</subject>

```

Note that the 5th *debate* video fragment has the *repeat* attribute set to *true*, which means that the user has to make a choice either for the *ProMeasures* continuation or for the *AntiMeasures* continuation, which is listed below:

```

<subject name="AntiMeasures">
  <longname>
    No, and I don't want climate measures!
  </longname>
  <score>3</score>
  <videos>
    <video file="mediocre-01"></video>
  </videos>
</subject>

```

The example shows how *subjects* can be connected, to allow for meaningful branches and continuations. Obviously, to give meaningful information to the user, *long names* are needed, in addition to the symbolic names by which the individual subjects are identified.

In summary, the basic XIMPEL Interactive Video Format supports the following elements:

- subject(s) – with video fragment(s)
- video(s) – to present the material
- question(s) – transitory or modal branching
- overlay(s) – to indicate choice point(s) for branching
- score(s) – assigning (bonus) points

Some refinements of the format, not treated here, include the indication of time duration for the overlays, as well as more extensive options for defining the size and visual appearance of overlays, for example by using semi-transparent images.

SCENARIO & STORY GRAPH

Having used the XIMPEL Interactive Video Format for a limited number of Clima Futura productions, a real challenge presented itself when we decided to use XIMPEL as the technical platform for a two-week undergraduate course, with as a general assignment:

project interactive multimedia

To design and develop a moderately complex multimedia application, with both educational and game elements, as part of a communication strategy for some particular goal or issue of societal relevance.

More specifically, the course aims to teach:

- elementary web-based multimedia technology
- programming/tools for interactive animation and video
- first principles of information visualisation
- basic media and communication theory
- the design of an effective communication plan
- business and societal context of media deployment

Since XIMPEL was still in a development phase, our major questions were whether the XIMPEL format would be sufficiently *expressive* for students to realize their creative aspirations, and, equally important, whether or not the students would stumble upon *technical issues* that, as developers, we had not foreseen.

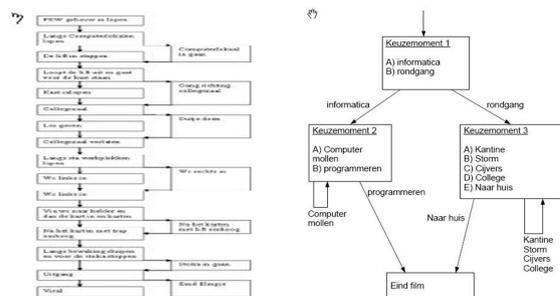


Fig 2. (a) Mario (107) (b) Tour (302)

In all respects the results of the course were very positive and exceeded our expectations. Both the viral clips that were produced, collected in the vumedia⁶ channel at youtube.com, as well as the interactive videos⁷, not only showed great variety, with some coming close to actually being a game (e.g. Mario, fig 2a), but were also surprisingly original and informative (e.g. Tour, fig 2b), due to the powerful graphics and video facilities of the flex/as3 platform.

An essential part of the assignment was to develop a scenario as well as a storygraph, where students were instructed, following Riedl & Young (2006), that: branching narratives are usually represented as directed graphs in which each node represents a linear, scripted scene, followed by a decision point. Arcs between nodes represent decisions a user can make.

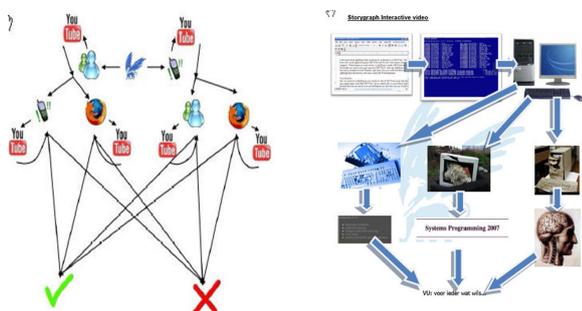


Fig 3. (a) SMS/MSN (205) (b) Course(s) (301)

Obviously, students had no difficulty in visualizing the XIMPEL configuration structure(s) in graphs and defining (sub) scenarios for the nodes of the graph. In effect, students showed great originality in presenting their designs, using either plain text or icons, fig. 2 and 3. It proved, however, to be more difficult for students to apply the *transitory questions* and even more so the *score options* in an effective and meaningful way.

During the course, for some of the technically more advanced students the need for extensions became apparent, not only for visual styling, but also functional extensions, with as in the case of the *Mario* application for example a real *SuperNintendo Mario* mini-game. To accomodate these wishes, students were allowed to experiment with the code, and in a later phase we will incorporate some of these extensions in the XIMPEL platform.

CINEMA AS GAME

Where, as we observe in Eliens & Ruttkay (2008), games are increasingly being used to produce video, using what is called *machinima*, the XIMPEL platform has been developed to enable the use of video as the carrier of game play, allowing for what we have characterized as *poor man's immersion* in Eliens et al. (2007b),

by deploying the immersive realism of video, based on conventions of storytelling and film editing⁸, Bolter and Grusin (2000). In particular, with the large amounts of material available on repositories like youtube.com, and the availability of affordable video cameras and video-enabled cellphones, authoring of video material comes at a fraction of the cost of developing virtual environments for platforms such as Second Life, see Eliens et al. (2007a), and the Halfife 2 SDK, see Eliens & Bhikharie (2006).

From film theory, Bordwell & Thompson (2001), we learn that narratives may be understood as: *a chain of events in cause-effect relationship occurring in time and space*. Obviously, giving the user control, as in interactive narratives, gives rise to new relationships, and defines additional challenges for the user, bringing the experience closer to game play.

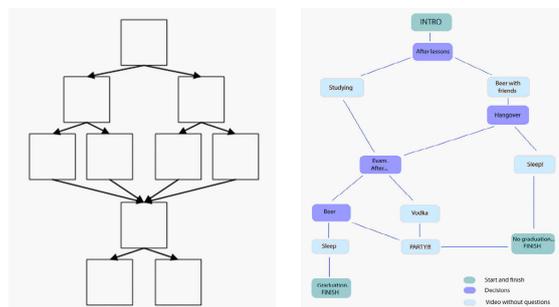


Fig 4. (a) Convergence (b) Divergence

Creating *branching structure(s)*, however, gives rise to new issues, and may even jeopardize authorship, in the following ways:

- *redundancy* – large amounts of video material are needed for branching, Sawhney et. al. (1996)
- *closure* – conflict of (user) control and coherence, Riedl & Young (2006)

However, problems of coherence can by and large be circumvented by including *vital story elements* in every possible navigation path, either by enforcing convergent paths, fig. 4a, or by adding redundant scenes necessary to bring about closure in the case of divergent navigation paths, fig 4b.

Following the definition given in Lindley (2005), stating that *a game is a goal-directed and competitive activity conducted within a framework of agreed rules*, we emphasize that the XIMPEL platform provides rich options to include additional challenges and options for the user to exert control. As a good example of a XIMPEL application that comes close to being a game, as well as conforming to the criteria listed in the introduction, we have already mentioned *Mario*, which however falls short of being a game by lacking a sufficiently well-defined mission and the omission of a meaningful scoring strategy. Additional challenges,

⁶www.youtube.com/vumedia

⁷www.cs.vu.nl/~eliens/media/view.html

⁸www.edgecodes.com

no doubt, may be introduced by realizing a smooth transition to mini-games as an extra option in modal branching questions.

score(s) & diagnostics Inspired by *game interaction pattern*, Björk & Holopainen (2005), in particular the *Score* patterns, we are extending the facilities for scoring to include support for incrementally adjusting for example the combined result parameters (*people, planet, profit*) of our climate game. that may conveniently be represented as vectors of features.

However, the facilities currently available already allow for interesting diagnostics, as for example the *moral profile* resulting from our Dante-inspired *Journey to Hell*⁹ application.

GAME RETHORIC(S)

In Eliens et al. (2007b) we already indicated the need for a more flexible way of including video fragments, and as the necessary background for such extensions we present here the major ideas underlying the Vox Populi system, Bocconi (2006). Vox Populi supports the classification and retrieval of video fragments based on that we may call *rethoric polarity*.

In Vox Populi, video fragments are annotated with meta-information to allow for searching relevant material, supporting or opposing a particular viewpoint. based on the users' preference, either a *propagandist* presentation can be chosen, expressing a single point of view (POV), a *binary commentator*, which shows arguments pro and con, or an *omniscient presenter* (mind opener), which displays all viewpoints. In the future development of XIMPEL we intent to include a *video content module*, that provides flexible access to the collection of video(s) by allowing for tag-based search and takes into account the rethoric content and polarity of the material. We believe that in this way we may provide the user with additional challenges, by presenting either conformant fragments or material that presents an antagonist position with respect to the users' observed preferences.

CONCLUSIONS

In this paper we have presented the XIMPEL Interactive Video platform, that allows for presenting *information*, by means of scenario-based interactive tours, and to provide the users with *game challenges*, by allowing choices in virtual story space, as well as transitory questions for the quick-witted user. An appealing feature of XIMPEL is the support for diagnostics, enabled by the score mechanism and by recording the users' navigation paths, which allows for meaningful

feedback about the users' position and preferences with regard to the topics dealt with.

Observing the popularity of online flash video, Larson & Costantini (2008), our choice for the flex/as3 framework seems well-motivated. Moreover, due to the expressiveness of our XML video configuration format, which allows for a far more rich underlying structure than the recent extensions for interactive video introduced by youtube.com, XIMPEL seems to be an excellent vehicle for a wide range of game-like applications, including service management games, Eliens & Chang (2007). In the near future we further hope to realize a fully functional scenario-based version of Clima Futura, that not only provides the user with possible mission(s), but at the same time will also give access to the wealth of video material and information on climate issues, as collected in our Climate Portal¹⁰.

REFERENCES

- Alexander C., Burnette A., Dark D. Hart D, Rossi J. , Minor N. (2007), *Beyond Launch: Museum Videos on YouTube*, In Proc. Museum on the Web 2008, Montreal, Canada
- Björk S. and Holopainen J. (2005), *Patterns in Game Design*, Charles River Media
- Bocconi S. (2006), *Vox Populi: generating video documentation from semantically annotated data repositories*, Ph.D. Thesis SIKS 2006-27
- Bolter J.D and Grusin R. (2000), *Remediation – Understanding New Media*, MIT Press
- Bordwell D., Thompson K. (2001), *Film Art: An Introduction*, 6th edition, McGraw-Hill
- Eliens A. and S.V. Bhikharie (2006), *Game @ VU – developing a masterclass for high-school students using the Half-life 2 SDK*, In: Proc. GAME'ON-NA'2006, Monterey, USA
- Eliens A. and Chang T. (2007), *Let's be serious – ICT is not a (simple) game*, In Proc. FUBUTEK 2007
- Eliens A. Feldberg F., Konijn E., Compter E. (2007a) , *VU @ Second Life – creating a (virtual) community of learners*, In Proc. EUROMEDIA 2007, Delft, Netherlands
- Eliens A., van de Watering M., Huurdeman H., Bhikharie S.V., Lemmers H., Vellinga P. (2007b), *Clima Futura @ VU – communicating (unconvenient) science*, In Proc. GAME-ON 07, Bologna, Italy

⁹www.cs.vu.nl/~eliens/ximpel/dante

¹⁰www.climateportal.nl

- Eliens A. and Ruttkay Z. (2008), Record, Replay & Reflect – a framework for understanding (serious) game play, submitted to GAME-ON 08, Valencia, Spain
- Lisa Larson and Renee Costantini (2008), *Flash Video for Professionals: Expert Techniques for Integrating Video on the Web*, Sybex
- Lindley E. (2005), Story and Narrative Structures in Computer Games, in Bushoff, Brunhild. ed. 2005. Developing Interactive Narrative Content: sagas/sagasnet reader. Munich: High Text
- Riedl M., Young M. (2006), From Linear Story Generation to Branching Story Graphs , IEEE Computer Graphics and Applications, 26(3), 2006. Special Issue on Interactive Narrative.
- Sawhney N., Balcom D., Smith I. (1996), HyperCafe: narrative and aesthetic properties of hypervideo, In: Proc. of the the seventh ACM conference on Hypertext, 1996