

3DWiki: The 3D Wiki Engine

Jacek Jankowski, Marek Jozwicz, Yolanda Cobos, Bill McDaniel, Stefan Decker
Digital Enterprise Research Institute, National University of Ireland, Galway, Ireland
firstname.lastname@deri.org

ABSTRACT

We demonstrate one of the potential paths of the evolution of wiki engines towards Web 3.0. We introduce 3dWiki - the 3D wiki engine, which was built according to 2-Layer Interface Paradigm (2LIP). It was developed for use by Copernicus, our vision of a 3D encyclopedia. In the demonstration:

- We give an overview of 2-Layer Interface Paradigm, an attempt to marry advantages of 3D experience with the advantages of narrative structure of hypertext.
- We describe step by step how to create an article for Copernicus: from creating models for the 3D background, through authoring the content, creating the c-links, to publishing the result in our encyclopedia.
- We show how to use a physics engine in our wiki.

Categories and Subject Descriptors

I.7.2 [Document and Text Processing]: Document Preparation – Hypertext/Hypermedia. I.3.7 [Computer Graphics] Three-Dimensional Graphics and Realism.

Keywords

2LIP, 3D Hypermedia, 3D Web, 3D Wiki

1. 2-LAYER INTERFACE PARADIGM

In 1992, during the Conference on Hypertext and Hypermedia, Jay D. Bolter gave a keynote speech on Virtual Reality and the Future of Hypertext [2], where he described how the two can be combined into “a *hypertextualized virtual space*”. 2LIP is an attempt to create such space – the new generation of text [7].

2LIP assumes that building graphical user interfaces involves the integration of two layers: (1) the background layer is a 3D scene; (2) the foreground layer, above the 3D view is presented semi-transparently hypertextual content, together with graphics and multimedia (e.g., videos or other interactive 3D). Hyperlinks are used for navigation in the 3D scenes (in both layers) – it is possible to “browse” the scenes following predefined paths (camera moves) invoked from the foreground hypertext layer.

2LIP builds upon several well established techniques: *Constraint 3D Navigation* [5] (it constrains the audience’s movement to interesting places – avoids the classic problem of users getting ‘lost-in-cyberspace’), *Transparency* (like Harrison and colleagues [6], we found that it can improve workspace visibility without harming interaction performance), the *Focus + Context* infoviz technique [3], *Animation* (like in [1], we found that animation improves users’ ability to reconstruct the information space).

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WikiSym’09, October 25–27, 2009, Orlando, Florida, U.S.A.
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2. 3DWIKI AND COPERNICUS

3dWiki (see <http://www.3dwiki.org>) is a 3D wiki engine. It resembles MediaWiki, the engine used by Wikipedia. However, it was implemented according to 2LIP and in comparison to a classic wiki page, the background in 3dWiki can be a 3D visualization of the place/object described in the article. It was developed for use by Copernicus, our vision of a 3D encyclopedia (see Figures and <http://copernicus.deri.ie>).

2.1 User Interface

While reading an article, the user can be presented with details from the 3D scene; clicking on the blue hyperlinks (there are two kinds of links in the articles: the blue links (c-links) to the places on the 3D scene and the red links to the other, external web resources), e.g., related to interesting places, or scrolling the text of the article, triggers a predefined camera movement. For example: a user reading an article about Polish Heritage Park in Olsztyn (see Figure 3a) might be interested in taking a closer look at a flag used during the great rebellion. Clicking the “flag” link triggers the animation. The camera will smoothly move over the 3D scene following the predefined motion path; it will stop behind the workshop showing this historical artefact. Users can also switch to the free navigation mode (see Figure 3b) at any time – it supports 3D interactions such as zoom, rotate, etc.

2.2 Author Interface

The process of creating new Copernicus pages consists of writing an article using a wiki markup language and composing a 3D scene from objects used on other scenes (option for *wikimaniacs*) or uploading a 3D models (option for *3D geeks*).

Once the author has created the 3D scene and has written the article, the interesting places in the 3D scene may be selected and connected to the links in the text. To create such c-link the author has to switch to the free navigation mode, position the camera, and click the “get coordinates” button. After that, the system will automatically switch back to the edit mode with the coordinates in the textbox; the author can use them to create the c-link:

```
[[[c-link name|x1,y1,z1|x2,y2,z2|t]]]
```

where: (x1,y1,z1) – the position of camera, (x2,y2,z2) – the viewpoint, t – time of the camera movement. This notion is very similar to the notion of a link in the wiki markup; therefore, we hope that *wikimaniacs* and other creative internet users will have no problem with using our system.

3. REFERENCES

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Figure 1. The idea behind 2LIP.

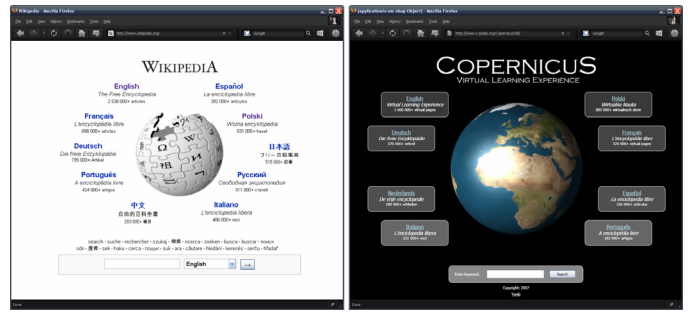


Figure 2. Welcome pages of Wikipedia and Copernicus.

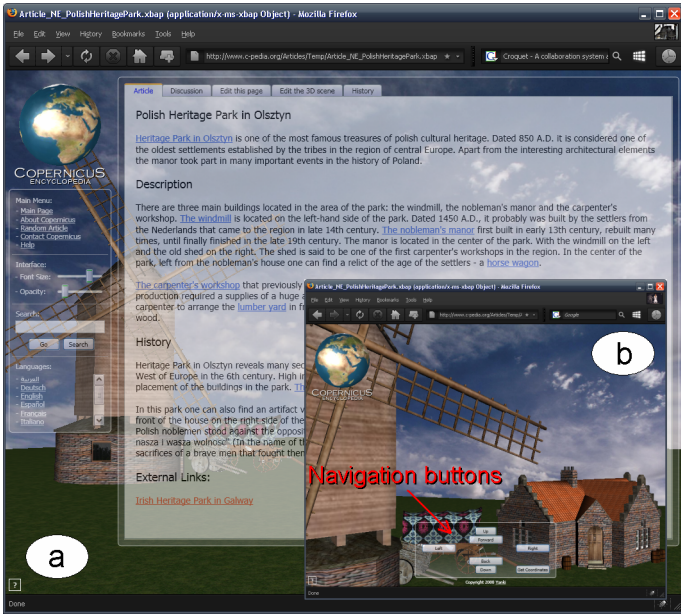


Figure 3. (a) The article. (b) The free navigation mode.

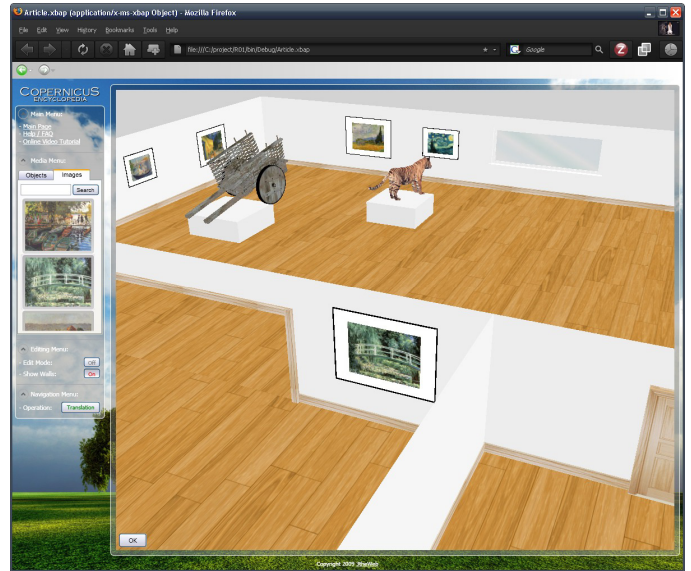


Figure 4. The 3D Editor.

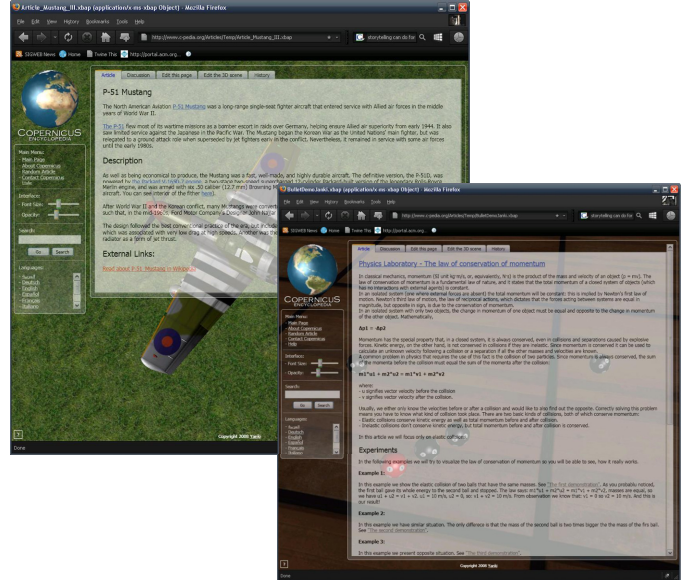
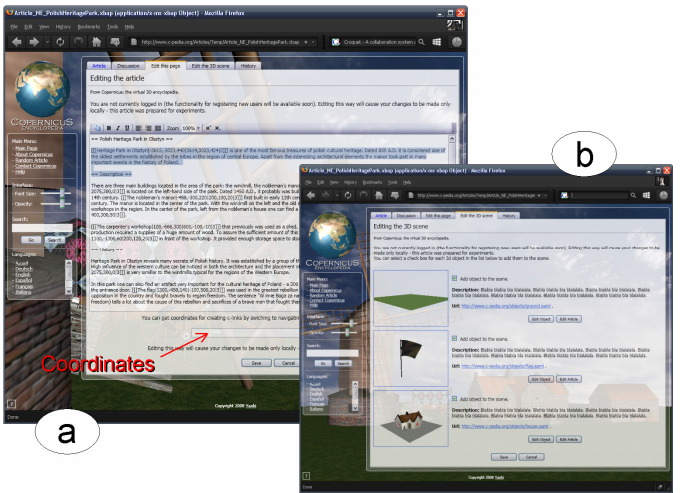


Figure 5. Left: Authoring interfaces in Copernicus: (a) the text, (b) the 3D edit tab; Left: Evaluation Results.

Above: Article about Mustang Fighter and the first article, where we used a physics engine (Bullet). We found this solution very helpful, especially for visualizations of physical laws (like in this example).

