# Continuous Web: A New Image-Based Hypermedia and Scape-Oriented Browsing

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## ABSTRACT
Conventionally, Web pages have been recognized as documents described by HTML. Image data, such as photographs, logos, maps, illustrations, and decorated text, have been treated as sub-components of Web documents. However, we can alternatively recognize all Web pages as images on the screen. When a Web page is treated as an *image*, its HTML data is considered to be metadata which describes the *image* content. Taking such a viewpoint, we propose a new image-based hypermedia which we call *continuous web*. In our model, there is no distinction between Web images and other images such as photographs.

Regarding everything on the Web as images leads us to consider a new style of browsing and navigating. We use the term *scape-oriented browsing*. We define a *scape* as a collection of continuously accumulated images. For example, whenever we walk in the real world, we can perceive and remember various forms of information through a *scape* process. Here, we describe new methods for s*cape-oriented browsing*, such as see-through anchors, parallel navigation, and peripheral scape presentation. We have designed and implemented a prototype system based on our model. Our system offers continuous browsing and navigation to users. We explain our concepts and discuss the effectiveness and potential of this approach.

## Categories and Subject Descriptors
H.4.3 [**Information Systems Applications**]: Communications Applications - *Information browsers*
H.5.4 [**Information Interfaces and Presentation**]: Hypertext/Hypermedia-*Navigation*

## General Terms
Management, Design, Theory

## Keywords
Images, Scape, Hyperimage

## 1. CONCEPT

### 1.1 Scape-Oriented Browsing
The conventional Web is based on documents, but regarding everything on the Web as *images* lets us consider a new style of browsing and navigating. We call this concept *scape-oriented browsing and navigation*. A collection of *scapes* provides us with rich information continually The relevant features of walking in an actual cityscape are that:

- Users can see their immediate destinations through the *scape*.
- Users can examine areas at the periphery of the focused *scape*.
- While walking, user can see continuous scene transitions.

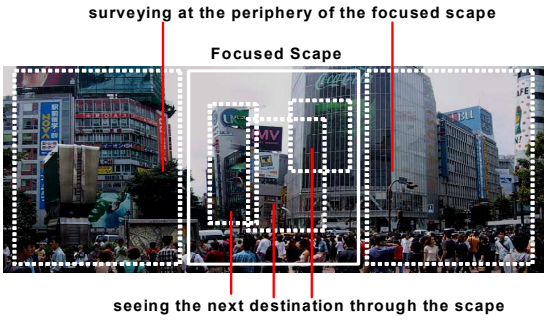


**Figure 1 Features of real-world browsing and navigation**

Figure 1 shows these features of seamless browsing and navigation in the real world. It is natural for us to continuously explore the real world in such a manner. This natural mode of recognition suggests various ways we can make Web browsing more intuitive:

- **See-through Anchors:** The notion of anchors can be extended into the notion of see-through anchors. Intuitively, a see-through anchor means that users can see the link destination through the anchor. By zooming in on a see-through anchor, users can view the destination *hyperimage* more clearly.
- **Peripheral *Scape* Browsing:** Whenever users walk in a real world space, they can see their immediate destinations as well as their peripheral area. To recreate this characteristic, we have developed a Web browser that allows a user to simultaneously browse both the destination page and the peripheral *scape*.
- **Parallel Link-Navigation:** A Web image usually contains more than one anchor. By zooming-in on a portion of a Web-image that contains more than one anchor, users can view more than one link destination at the same time. This is called *parallel link-navigation*, which is not supported by the conventional Web model or conventional Web browsers.


*WWW 2004*, May 17-22, 2004, New York, NY USA.
ACM 1-58113-912-8/04/0005.

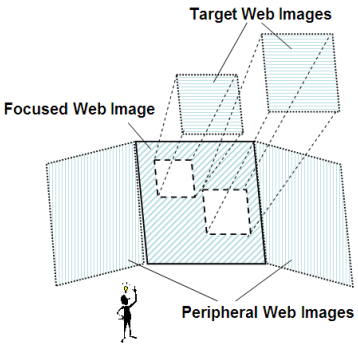


**Figure 2 Navigation model link to walking in a cityscape.**

Figure.2 describes our conceptual image for new style Web-browsing.

## 2. IMPLEMENTATION

We have designed and implemented a browsing environment to test our models. Our system consisted of a server, the *WebPhotoServer*, and a new web browser for clients, the *WebWalker*. Figure 3 shows the system architecture.

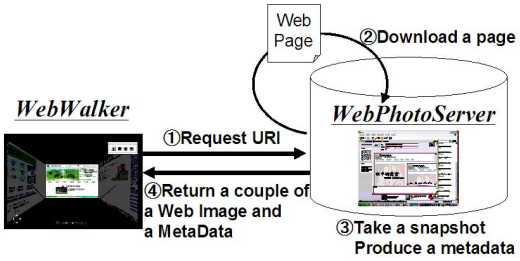


**Figure 3 System architecture**

### *2.1 WebPhotoServer*

When the *WebPhotoServer* receives a request with a URI, it returns a pair consisting of a *Web image* and metadata containing the image's original HTML text data and anchor position information. The process is performed as follows:

(1) The server receives a request with a URI.

(2) The server gets an HTML source from the Web and displays it as a Web page (by using one of the conventional Web browsers which can be selected).

(3) The server takes a snapshot of the Web page, and produces a *Web image* and the related metadata.

(4) The server returns a pair consisting of a *Web image* and its related metadata.

The metadata is described in an XML format. Through access to a document object model (DOM), the geometric coordinates of HTML tag elements on the screen are easily obtained.

### *2.2 WebWalker*

*WebWalker* is a web browser that incorporates the new methods Its interface consists of three main parts: a zooming slider, scroll buttons, and a main window.

- The **zooming slider** enables users to zoom in and out.
- **Scroll buttons** enable users to change their observational scope vertically and horizontally.
- The **main window** displays several *images*. The user can click an *anchor image* to get the next *image*.

Screen images of *WebWalker* are shown in Figure 4.

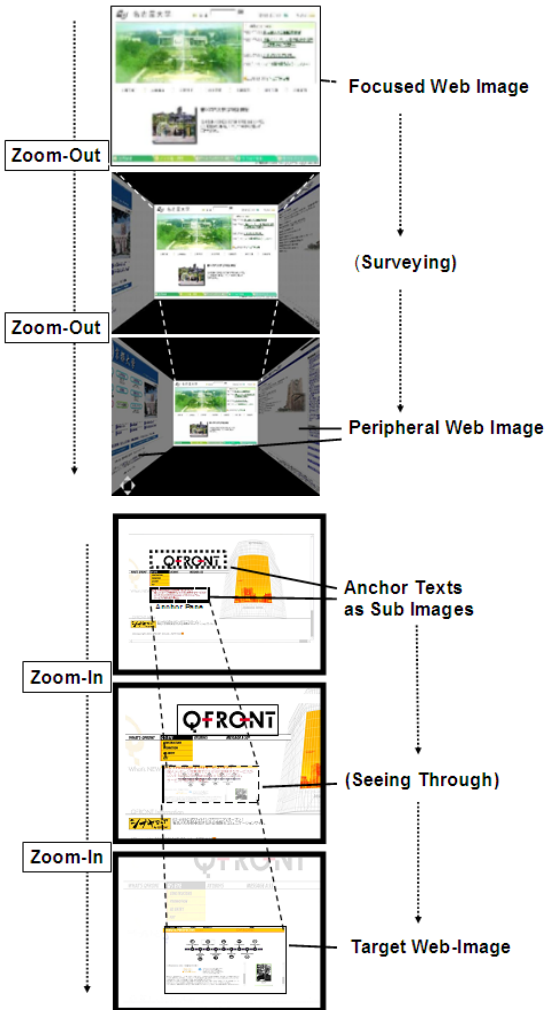


**Figure 4 The *WebWalker* interface**

We made a demonstration movie of our browsing/navigation system which can be viewed at

<http://www.dl.kuis.kyoto-u.ac.jp/~hirotanaka/webwalker.avi>