TITLE

Display System For Multimedia Data

FIELD OF THE INVENTIONS

This invention relates to a display system for multimedia data. The invention has particular, although not exclusive, utility in relation to implementation incorporating digital television (TV) systems.

BACKGROUND ART

Analog and digital TV signals are usually distributed either by transmission over a cable network or broadcast using a wireless transmission. The television signal continuously transmits picture and sound information which is displayed at each receiver without delay and without processing the signal. More particularly, the TV receiver does not perform any processing on a received signal based on its content type, but simply displays the received signal.

In contrast, a computer connected to the Internet is capable of receiving multimedia data, which is processed by a browser running on the computer according to the content of the multimedia data. However, data transmission across the Internet is effectively a point-to-point transmission and not a broadcast transmission.

SUMMARY OF THE INVENTION

In accordance with one aspect of this invention, there is provided a display system for multimedia data, comprising: a transmitter station comprising a source of multimedia data arranged as objects, means for arranging said objects into packets, and means for broadcasting said packets; and at least one receiver stations comprising means for receiving the packets and arranging the received packets into objects, and processing means arranged to process the objects

according to their content type.

Preferably, the transmitter station includes means for scheduling the broadcast of the objects.

Preferably, the objects include a scheduling object, the processing means being responsive to the scheduling object in processing said objects.

Preferably, each receiver station includes a cache in which received objects are stored prior to being processed.

Preferably, said content types include images, text, marked-up languages such as HTML, Java, sound.

Preferably, the means for broadcasting said packets comprises a digital TV broadcast network with wireless or wired transmission.

Preferably, said digital TV broadcast network includes means for multiplexing said packets with digital TV data.

In accordance with a second aspect of this invention, there is provided a method for displaying multimedia data, comprising the steps of: arranging the multimedia data as objects, arranging the objects into packets, broadcasting the packets from a transmitter station, receiving the broadcast packets on at least one receiver station, arranging the received packets into objects at the receiver station, and processing the objects at the receiver station according to their content-type.

Preferably, said method includes the step of scheduling the packets for broadcast at the transmitter station.

Preferably, said method further includes the step of transmitting a scheduling object and scheduling the processing of received objects at the receiver station

according to said scheduling object.

DETAILED DESCRIPTION OF THE EMBODIMENT

The embodiment is directed towards a display system for multimedia data delivered by way of digital TV broadcast. The display system of the embodiment comprises a transmitter station and at least one receiver station. Although the embodiment will be described with reference to a single receiver station, it should be appreciated that in practice a plurality of receiver stations would likely be within reception of the broadcast.

The transmit station comprises a source of multimedia data arranged as objects, scheduling means for scheduling the broadcast of said objects, means for arranging the objects into packets, and means for broadcasting the packets. The source of multimedia data is a storage device of suitable type, such as a hard disk, optical storage or the like.

The multimedia data is arranged as objects, each of which has a content-type and a meaning to the receiver station based on that content-type. Examples of content type include image, sound, text, HTML and Java programming code. A further content type is a scheduling object which will be described herein after.

Collectively, the objects can define any form of multimedia presentation, such as an electronic shopping mall.

In this embodiment, the scheduling means of the transmitter station is simply a list defining when each multimedia object is to be broadcast. Enhancements to the scheduling means, such as the ability to schedule the broadcast of groups of objects collectively, and to define an interval between retransmission of an object or group of objects can be provided. Retransmission of the objects may be desirable because of the transmit only nature of the transmitter station.

When an object is scheduled for transmission according to the list, a copy of the object is converted into packets suitable for transmission. In this regard, the packets perform a similar function to packets in a computer network. The packets are then forwarded to the broadcast system for broadcasting. The multimedia data can either occupy a dedicated channel of the digital TV spectrum, or alternatively the packets can be multiplexed with a digital TV broadcast as a content stream.

The receiver station comprises a computer having a digital TV reception card and a data storage medium such as a hard disk, a portion of which is arranged to operate as a cache for received objects. When operating, the digital TV receiver card receives the broadcast transmission and communicates the received packets to the computer. The computer assembles the received packets into objects and stores them in the cache.

In the absence of the computer having received a scheduling object, the computer is arranged to process the received objects in the order in which they are received. In this regard, default settings may be provided, such as the time lapse between processing objects or the time that images are required to be stored before disposal.

The computer is arranged to process each object according to its content type, so that an object with a content type of sound will be played so the user can hear the sound, see an image, see text or HTML which will be displayed on the screen for viewing by the user, and so forth.

If a scheduling object has been received, the computer processes the objects in accordance with the scheduling object. A scheduling object can provide for the order in which objects are to be processed, and the delay between the processing of each object and the processing of the subsequent object. Further, the scheduling object may provide for the processing of multiple objects simultaneously, such as processing audio and image or text objects

simultaneously.

The scheduling object may also include information regarding whether the processing of the objects is to be repeated after a certain time period, and whether the order of processing of a group of objects is to be randomised. Further, the scheduling object may provide scheduling based upon predefined events, such as if no input is received from the user for a certain period of time, then a predetermined object is to be processed. The scheduling object may also provide error handling. For instance, the scheduling object may contain instructions in the event that an object which is scheduled to be processed is not present in the cache.

If a scheduling object is present, received objects are simply stored in the cache until they are needed for processing.

Thus, in contrast with television broadcast where pictures and audio are continuously broadcast and are displayed by a receiver without content-based processing, the display system of the invention provides a system where multimedia data is broadcast as digital objects using a digital TV broadcast system, received by the receiver, stored and subsequently processed according to its content type, and possibly also according to a schedule.

Further, it should be appreciated that the broadcast of the objects and the processing of the objects are asynchronous events.

It should be appreciated that this invention is not limited to the particular embodiment described above.

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CLAIMS

A display system for multimedia data, comprising: a transmitter station comprising a source of multimedia data arranged as objects, means for arranging said objects into packets, and means for broadcasting said packets; and at least one receiver station comprising means for receiving the packets and arranging the received packets into objects, and processing means arranged to process the objects according to their content type.

A display system as claimed in claim 1, wherein the transmitter station includes means for scheduling the broadcast of the objects.

A display system as claimed in claim 1 or 2, wherein the objects include a scheduling object, the processing means being responsive to the scheduling object in processing said objects.

A display system as claimed in any one of the preceding claims, wherein each receiver station includes a cache in which received objects are stored prior to being processed.

A display system as claimed in any one of the preceding claims, wherein said content types include images, text, marked-up languages such as HTML, Java, sound.

A display system as claimed in any one of the preceding claims, wherein the means for broadcasting said packets comprises a digital TV broadcast network by wireless or wired means.

A display system as claimed in any one of the preceding claims, wherein said digital TV broadcast network includes means for multiplexing said packets with digital TV data.

A method for displaying multimedia data, comprising the steps of: arranging the



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multimedia data as objects, arranging the objects into packets, broadcasting the packets from a transmitter station, receiving the broadcast packets at at least one receiver station, arranging the received packets into objects at the receiver station, and processing the objects at the receiver station according to their content-type.

The method claimed in claim 8, including the step of scheduling the packets for broadcast at the transmitter station.

The method claimed in claim 8 or 9, further including the step of transmitting a scheduling object and scheduling the processing of received objects at the receiver station according to said scheduling object.

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