

USER SELECTABLE LOCK REGIONS

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application contains subject matters related to co-pending application Ser. No. 07/816,623 entitled Method and System for Identifying Users in a Collaborative Computer-Based System, and application Ser. No. 07/816,951, entitled Cursor Lock Region, filed on even date herewith and assigned to the assignee hereof and incorporated by reference herein.

BACKGROUND OF THE INVENTION

1. Technical Field

The field of the invention relates to a collaborative computer based system and more particularly to a modified What You See Is What I See multiuser interface for a collaborative editor. Still more particularly the invention relates to a method of protecting user selectable blocks of a shared data object in collaborative computer based system from simultaneous manipulation originating with users.

2. Description of the Related Art

A collaborative system may be defined as a real-time computer based environment coordinating individual efforts toward completion of a task. The task or subject of a group's attention may be a document, a production schedule, a computer program, a product design, or any other task, solution of which is represented by the organized expression of information. Construction of that expression is presumed aided by the efforts of more than one person and particularly by the simultaneous efforts of more than one person.

A computer network is typically the vehicle for coordinating work. The subject of the work is typically structured as one or more shared data objects stored in memory accessible over the network. The machine for constructing the data object is software, such as a text editor or data base management facilities. The user accesses the shared data object through multiuser interface facilities supported by the network.

A shared data object is one which is simultaneously accessible to a plurality of users over the network. Such data objects can include, for example, word processing documents and spread sheets. A shared data object is a data object to which more than one user at a time is permitted some type of access.

Thus, a common issue facing designers of collaborative systems is the type of concurrent access permitted each of a plurality of users. The core issue has a number of subsidiary issues. User access can be limited to the ability to read an object, but more commonly includes some rights to manipulate or change the object. For example: Who among the users is permitted rights to change the data object? Shall each user be shown the same representation of the data object? How free are users to be in changing their viewpoint of the shared data object?

A user has access to a shared data object through a multiuser interface. The interface typically includes a video monitor under the control of the user's local workstation, through which views of the shared data object are displayed. The interface is supported by software allowing multiple simultaneous access to an object with the right to manipulate the contents of the object. The general characteristics of one category of common multiuser interface are referred to as the What You See

Is What I See (WYSIWIS) concept. In strict form, each user sees exactly the same thing, from the same viewpoint, with each user being given apparent immediate rights to manipulate the shared object. All user cursors are simultaneously displayed. Updates are transmitted to each participant, allowing the participants to see what is being done as it is done. In practice the WYSIWIS concept is partially relaxed. For example, users are typically permitted to select their point of view. User selected points of view are known as private views of public objects. In a word processing document a user selects the portion of the document of current interest to that user as a private view.

While the WYSIWIS concept has been relaxed for convenience sake, it has also been relaxed as a concession to limits in the technology. Consider the example of collaborative work on the text of a word processing document. Each user having current access to the document has a window generated on the video monitor of his or her local workstation, with text taken from the document reproduced in the window. Each user will have one text cursor, indicating the point in the document where the user may make changes. In strict WYSIWIS, all text cursors are to be displayed. In practice, the inability to distinguish ownership of a cursor on sight has proven confusing, sometimes requiring suppression of private cursors, except the user's own, from a user's video monitor.

Conflicts or collisions in user actions, such as simultaneous attempts to change the same word in a word processing document, can also cause problems. In strict WYSIWIS, conflicts are allowed to occur. Each user is given an impression of immediate accessibility. In a setting where the workstations are all in one room, or a form of teleconferencing is occurring, permitting such collisions is tolerable because the participants can settle the dispute by conversation. Collisions are less tolerable where the usual communication between users is that which is implied by changes in the shared document.

SUMMARY OF THE INVENTION

Thus it is an object of the invention to provide a method of enhancing cooperative work in a collaborative computer system.

It is another object the invention to provide a collaborative editing system for shared data objects.

It is yet another object of the invention to provide a modified What You See Is What I See (WYSIWIS) interface.

It is still another object of the invention to provide a method of protecting user selectable blocks of a shared data object in collaborative computer based system from simultaneous manipulation originating with users.

The foregoing objects are achieved as is now described. The method of the present invention may be utilized for protecting blocks of a shared data object in collaborative computer based system from simultaneous manipulation originating with two or more users. The collaborative computer based system includes a network connecting a plurality of terminals for communication. Each terminal includes an output display device and a user input device. The collaborative computer based system includes a shared data object simultaneously accessible by a plurality of users of the system. Responsive to a user obtaining access to the shared data object, the user is assigned a cursor available for display on the visual display devices of all current users. A user