

According to one aspect of the invention there is provided in a multi-media collaborative computer based system including a network connecting a plurality of terminals of communication, an output display device for each terminal, a user input device for each terminal, and a shared data object concurrently accessible by a plurality of users of the system, a method of protecting transitory, floating blocks of the shared data object from concurrent manipulation originating with more than one user, the method comprising the steps performed by a computer of:

responsive to a user obtaining access to the shared data object, assigning the user a cursor available for display on the output display devices;

releasing a previously established cursor associated lock region upon movement of the cursor outside of the previously established cursor associated lock;

responsive to the movement of the cursor, determining a position for a cursor associated lock region related to the position of the cursor in the shared data object; and

if the position for the cursor associated lock region does not include a portion of an established lock region, establishing the cursor associated lock region for the cursor.

According to another aspect of the invention there is provided a collaborative multi-media computer based system for protecting transitory, floating blocks of a shared data object from concurrent manipulation originating with two or more users, the collaborative computer based system comprising:

a plurality of terminals, each terminal having an output display device and a user input device;

a computer;

a network connecting the terminals and the computer for communication;

the shared data object being simultaneously accessible through a plurality of private views by a plurality of users;

means, responsive to a user obtaining access to the shared data object, for assigning the user a cursor available for display on the output display devices;

means, responsive to user selection, for moving a cursor assigned the user within the shared data object;

means, responsive to movement of a cursor, for determining a position for a lock region associated with the cursor in the shared data object;

means, responsive to movement of the cursor outside of a previously established lock region, for releasing the previously established lock region; and

means, responsive to the position not including any portion of any previously established lock region, for establishing the new lock region.

Figure 1 is a pictorial view of a local area network with which the invention is advantageously employed;

Figure 2 is a pictorial view of a window generated by computer graphics system to support the user interface of the invention;

Figure 3 is a pictorial view of a window opened to a target textual object for editing;

Figure 4-7 are pictorial views of a window opened to a target graphical object as the window is edited;

CLAIMS

1. In a multi-media collaborative computer based system including a network connecting a plurality of terminals of communication, an output display device for each terminal, a user input device for each terminal, and a shared data object concurrently accessible by a plurality of users of the system, a method of protecting transitory, floating blocks of the shared data object from concurrent manipulation originating with more than one user, the method comprising the steps performed by a computer of:

responsive to a user obtaining access to the shared data object, assigning the user a cursor available for display on the output display devices;

releasing a previously established cursor associated lock region upon movement of the cursor outside of the previously established cursor associated lock;

responsive to the movement of the cursor, determining a position for a cursor associated lock region related to the position of the cursor in the shared data object; and

if the position for the cursor associated lock region does not include a portion of an established lock region, establishing the cursor associated lock region for the cursor.

2. A method of protecting transitory, floating blocks of the shared data object from concurrent manipulation originating with more than one user as set forth in claim 1, wherein the permitting step includes:

determining if any user selected conditions for establishment of a cursor lock region exist;

if such conditions exist determining if they are met; and

if the conditions are met establishing the cursor associated lock region.

3. A method of protecting transitory, floating blocks of the shared data object from concurrent manipulation originating with more than one user as set forth in claim 2, wherein the media of display include graphics and picture, the method further comprising the step of:

responsive to user selection, establishing an object mode for a cursor associated lock region wherein a condition for establishing the cursor associated lock region is the presence of an object under the cursor.

4. A method of protecting transitory, floating blocks of the shared data object from concurrent manipulation originating with more than one user as set forth in claim 1, the method further comprising the steps of:

determining whether a current user initiated action dictates modification of the shared data object;

if the current user initiated action is a modification, determining if the modification would occur within a lock region; and

if the modification would occur within a lock region and if attempted through a cursor other than the one associated with the lock region, preventing the modification.

5. A method of protecting transitory, floating blocks of the shared data object from concurrent manipulation originating with more than one user as set forth in claim 1, wherein the shared data object text.

6. A method of protecting transitory, floating blocks of the shared data object from concurrent manipulation originating with more than one user as set forth in claim 1, wherein a plurality of modes controlling shape and size of a cursor associated lock region are permitted each user.

7. A method of protecting transitory, floating blocks of the shared data object from simultaneous manipulation originating with more than one user as set forth in claim 1, wherein

an assigned cursor includes a visual attribute to distinguish it as to its owner.

8. A collaborative multi-media computer based system for protecting transitory, floating blocks of a shared data object from concurrent manipulation originating with two or more users, the collaborative computer based system comprising:

a plurality of terminals, each terminal having an output display device and a user input device;

a computer;

a network connecting the terminals and the computer for communication;

the shared data object being simultaneously accessible through a plurality of private views by a plurality of users;

means, responsive to a user obtaining access to the shared data object, for assigning the user a cursor available for display on the output display devices;

means, responsive to user selection, for moving a cursor assigned the user within the shared data object;

means, responsive to movement of a cursor, for determining a position for a lock region associated with the cursor in the shared data object;

means, responsive to movement of the cursor outside of a previously established lock region, for releasing the previously established lock region; and

means, responsive to the position not including any portion of any previously established lock region, for establishing the new lock region.

9. A collaborative computer based system for protecting transitory, floating blocks of a shared data object as set forth in claim 8, wherein means for establishing the new lock region further includes:

means for establishing a cursor lock mode specifying coverage of any cursor associated lock region; and

means, responsive to user selection of a particular lock mode for specifying conditions under which a cursor associated lock is to be generated.

10. A collaborative computer based system for protecting transitory, floating blocks of a shared data object as set forth in claim 9, wherein one cursor lock mode is an object mode, wherein a cursor associated lock region extends to a defined subobject within the shared data object upon the condition that the cursor lies over the subobject.

11. A collaborative computer based system for protecting transitory, floating blocks of a shared data object as set forth in claim 9, wherein the collaborative computer based system further comprises:

~~means for serializing user commands.~~

12. A collaborative computer based system for protecting transitory, floating blocks of a shared data object as set forth in claim 11, the collaborative computer based system further comprising:

means for checking whether a command from the current user indicates modification of the shared data object;

means, responsive to such a command, for determining if the indicated modification occurs within a lock region associated with a cursor other than the cursor assigned the current user;

means, responsive to positive determination, for blocking the modification; and

means, responsive to a negative determination, for entering the modification.

13. A collaborative computer based system for protecting transitory, floating blocks of a shared data object as set forth in claim 8, wherein the shared data object is manipulated by a text editor.

14. A collaborative computer based system for protecting transitory, floating blocks of a shared data object as set forth in claim 8, wherein

~~an assigned cursor includes a visual attribute to distinguish it as to its owner.~~