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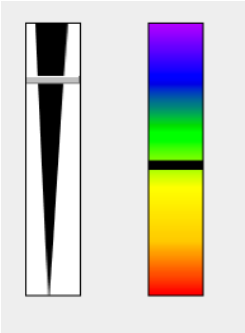
Report of project

Multiple user drawing application

The main propose of our project is to create a crossing based multiple user drawing system that can be used by everybody easily and efficiently. Instead of pointing, the crossing metaphor allows users to choose multiple features at the same time by using the crossing gesture, which could reduce the time of selection and augment the efficiency. This system mainly provides three basic functions:

- ✶ Slider and toolbar implemented with the crossing methods
- ✶ Gesture recognition
- ✶ Communications between two devices

Slider

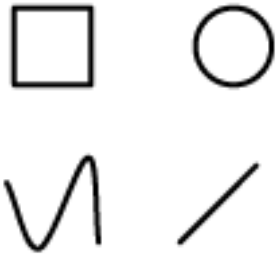


The crossing based slider widget consist of two parts: the slider of stroke size and the slider of fill color. Users are allowed to select the stroke size and the filled color within one crossing gesture. Users can cross these two sliders from left to right or right to left to select these two features. The pointer on the slider will move following the cursor to indicate users its feature that is currently selected. The selection of features refers to exit position of cursor when the cursor leaves the slider.

Toolbar

The toolbar has eight items on it, which represents eight functions :

The first button is used for selecting item on the canvas. When we click on this button, it changes to 'selection mode', and we can use the cursor to select or move the item on canvas. Further more, we can also do crossing in 'selection mode', the cursor will draw an orange line when we press and drag our targets on the canvas.



The second to fifth bouton is used for creating shapes on canvas, at first we should click on/cross over the first button to change to the 'selection mode', then we can directly click on these bouton to draw shapes on the canvas. When if we want to change the outline size and color of the shapes, we could drag on the canvas and cross the orange line on the bouton, and there would be two drop-down menus appearing. Each menu contains three items for users to choose, so we can cross the orange line on these two menu to choose the outline size and the color of shapes.

The sixth button is used for adding graphics on the canvas. When we click on/cross over this button, it will open a file chooser, and we can select a picture from the chooser. After clicking 'OK', then we can draw a rectangle on canvas. Just like what we've done with the second bouton, we can change the size of the rectangle when we draw it. If we release the mouse, the pictures selected will be added to the canvas. For the graphics added, we can also move/copy/delete them as what we can do to the shapes.

The eighth button's objective is to help users understand and learn how to use the gesture and others methods of operations in this application. After clicking on it, a new window will be open automatically, and it will show some operating instructions that can help solving some problems met by our users.

Gesture

The seventh one on toolbar is the "gesture" button: when we click on/cross over this button, the system will swift to "Gesture" mode, and we can draw a blue line that follows the trajectory of our gestures on canvas by pressing our mouse. We've defined two gestures for this application: firstly, if we draw a horizontal line on an item, we can delete it; secondly, if we draw a large C-shaped gesture on an item, we can duplicate it. In the Class TrainingDefine, we can run and open a graphic interface, and we can open a file named vocabulaire.cl in the folder rsc. In this interface, we can set the different possible gestures with

various operation modes (for example: delete, duplicate), and we can also add a new operation mode or delete it.

Communication between two devices

The communication between two terminals is based on TCP/IP protocol and is realized by using Java socket programing. One PC will play the role as server and another will act as client. The IP addresses of server and client are pre-initialized before launching the system. When one user finishes his part of design work, he can choose serval items and send them to his partner. The multiple items selection is also provided by using the crossing method. After selecting of items, users can press "enter" to send them out. And items with the same color and stroke size will be created and be shown on the receiver's canvas.

Consider the situation in reality, we abandon the real-time communication to reduce conflicts and provide users with more choices of sending the items in the way they prefer.

Simplifications

- Gesture simplification: at first, we set up two gestures to duplicate items, using one gesture for copying item, another one for pasting item. Then we realized that it was not necessary. We can not select the cursor position on the drawing board, and using two gestures will only become more complicated. In this case, we simplify it into one gesture, and it can copy and paste items directly with only one gesture.

- Initially, we could only crossing gesture to trigger the slider and the toolbar, but then we discovered that if we just wanted to draw a rectangle without selecting the size and color of the shape's outline, it would take less time to use clicking than crossing gesture, so we add clicking gesture to toolbar, and we can click on boutons without wasting time to cross over them all.