K-Sketch: Digital Storytelling with Animation Sketches

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Abstract. K-Sketch gives novice animators an easy way to tell stories with animation sketches. It relies on users' intuitive sense of space and time, and makes animation easy through the use of sketching and demonstration. Our studies have shown that people take naturally to telling stories with K-Sketch, and it is particularly helpful for exploring the timing of events. We also found that K-Sketch is a good collaborative medium for telling stories. In this demonstration we will show how K-Sketch works and explain how these advantages are realized in practice.

Keywords: Storytelling, animation, sketch, demonstration-based, informal user interfaces.

1   Introduction

Animations provide an attractive and engaging way to communicate ideas that are difficult to put into words, but most animation tools are difficult to learn and use. K-Sketch gives novice animators an easy way to tell stories with animation. K-Sketch provides an informal, sketch-based [4, 5] and demonstration-based [1] interface that makes animation easy by relying on users' intuitive sense of space and time. Originally built for pen-based computers, K-Sketch was recently redesigned to work for multitouch mobile devices, specifically iPads and Android tablets. This demo will explain how the K-Sketch user interface works and how it has been used to tell stories.

2   The K-Sketch User Interface

K-Sketch is implemented using Adobe's Flex toolkit and AIR runtime. The user interface provides a single design space and is visually divided into three parts: tool palette on top, a drawing canvas in the center, and time controls on the bottom.

2.1   Positioning and Animating Objects

Tapping on an object or drawing a loop around it with the lasso tool will select it (Fig. 1-f). Dragging different regions of the manipulator executes different transformation operations: center region to translate, circle region to rotate, and any of the four cornered arrows to scale. Tapping on the manipulator (or double-tapping on an unselected object) enters a special mode where the next manipulation will be "performed"
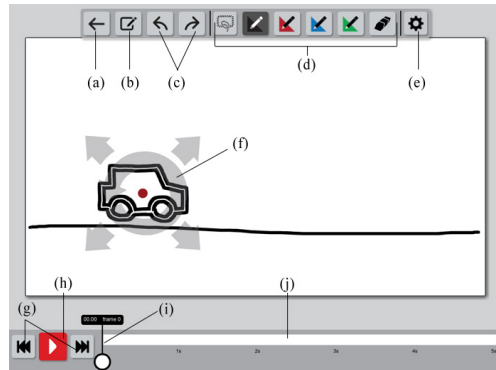
Fig. 1. K-Sketch User Interface. (a) Back to Main, (b) New Canvas, (c) Undo/Redo buttons, (d) Lasso, Pen and Eraser buttons, (e) Options button, (f) Object Manipulator, (g) Previous/Next Key Frame buttons, (h) Play button, (i) Time Slider and Magnifier, (j) Time bar.

(i.e., recorded in real time). After a motion has been recorded for an object, modifying the object's position will stretch the earlier part of a motion path, but leave the later part unchanged, as shown in Fig. 2(a).

Performing motions in this mode is users' primary means for creating animation, but we also support key-frame animation. Inserting a key frame pins an object to a location at a particular time. This can cause later parts of a motion path to stretch, as shown in Fig. 2(b).
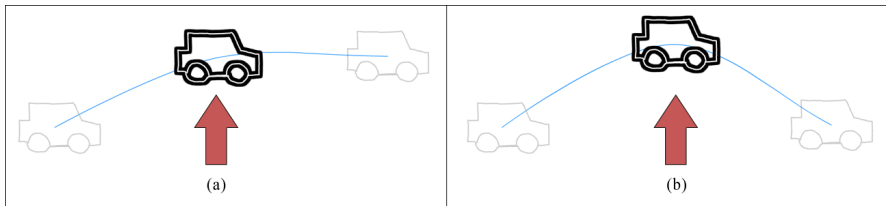

Fig. 2. Changing an object's position in the middle of a motion stretches motion paths. In both figures, the original motion was from left to right, and the car was moved up half way through the motion. (a) The normal case. (b) When a key frame follows the current time.

2.2 Time Bar Navigation

Many animation tools include a timeline control that displays the history of every moving object. K-Sketch provides a simplified timeline that compresses all events into one list [3]. Performing a motion adds a gray tick mark at the beginning and end of the motion, changing an object's position in the middle of a motion adds a gray tick mark, and inserting a key frame adds a thick, black tick mark. When an object is selected, the timeline shows events for that object only. Users can modify the timing of a motion by selecting and dragging a tick mark along the time bar. Pressing and holding the time slider on a tick mark will select the tick mark. A magnifier appears to show that the tick mark is selected (see Fig. 3).
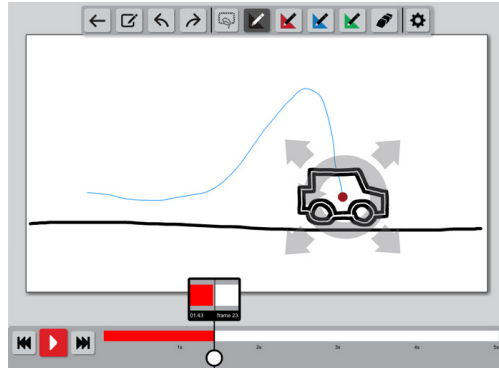
Fig. 3. Dragging a selected tick mark to adjust the end time of a motion path

3 Telling Stories with K-Sketch

K-Sketch encourages a wide variety of stories to be expressed quickly and clearly. In a previous field study, secondary school students used animation sketches to tell stories about science concepts (see Fig. 4). Telling stories with animation helped to motivate students, revealed misconceptions, and also helped retention of information. In another study, a UI design student used K-Sketch to tell stories about the behavior of a user interface (see Fig. 5). The ability to present her ideas efficiently and effectively facilitated team discussions and expedited the design process [6].
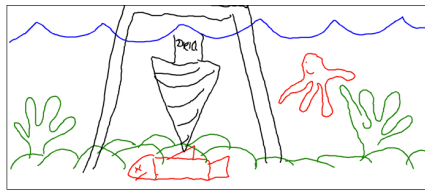

Fig. 4. An animated story about formation of crude oil created by a child during a field study
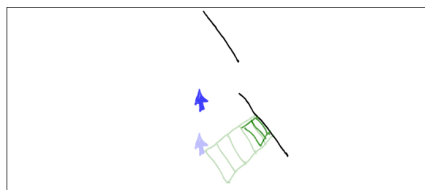

Fig. 5. Trapezoidal feedback animation created by a UI design student during a field study

Lastly, we conducted a study where children designed video games by telling stories about game sequences [2]. We found that children were about as good at describing game behavior with sketched animation as they were with words or static

sketches, and that animation was particularly well suited to describing action sequences. Also, the children in our study took naturally to collaborating around sketched animation: stories unfolded as one child would pick up and embellish an animation sketched by another child.

4 Conclusion

This demonstration will present K-Sketch as medium for telling stories. We will show how the K-Sketch user interface works, and we will show how it is being used to tell stories.

References

1. Baecker, R.: Picture-Driven Animation. In: Proc. AFIPS Spring Joint Computer Conference, vol. 34, pp. 273–288 (1969)
2. Colwell, B., Davis, R.C., Landay, J.A.: A study of early stage game design and prototyping. Technical report UW-CSE-08-10-03, Computer Science and Engineering Department, University of Washington, Seattle, WA (October 2008)
3. Davis, R.C., Colwell, B., Landay, J.A.: K-sketch: a 'kinetic' sketchpad for novice animators. In: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pp. 413–422. ACM (2008)
4. Gross, M.D., Do, E.Y.: Ambiguous intentions: a paper-like interface for creative design. In: Proc. UIST 1996, pp. 183–192 (1996)
5. Landay, J.A., Myers, B.A.: Sketching Interfaces: Toward More Human Interface Design. IEEE Computer 34(3), 56–64 (2001)
6. Davis, R.C.: K-Sketch: A Kinetic Sketch Pad for Novice Animators (Unpublished doctoral dissertation). EECS Computer Science Division, University of California, Berkeley, CA (2008)