

Movement Perception; Event Perception

Muller & Schumann [6] assert that there are fundamentally two techniques for representing motion: time-dependent (dynamic) and non-time dependent (static). In this essay, I will discuss three examples of visual designs which employ both techniques to effectively portray movement, time, and events.

The Apple iMovie visual interface is an example for how event perception can be displayed both statically and dynamically [1]. The dynamic portion is the video window at the top right of Fig 1, and the static portion is the timeline in the top-left. The static portion shows select frames from the movie. This follows the idea of a comic strip, with scenes divided up into panels with some spacing between them. The first scene is broken up into three events – the snowboarder taking off, flying through the air, and then landing. According to [2], these “key” frames should be selected to have the largest change in motion between subsequent frames. This should correspond to how the human visual system segments time into events, and perceives events as objects with the “edges” corresponding to high rate of change in the temporal (rather than spatial) dimension [3]. It may also be interesting to try combining the key frames into a single image depicting motion [4], showing the beginning, middle, and end of each event. This may help to reduce clutter and improve the ease of use of the visual design.



Figure 1: iMovie visual interface

In the 1990's, Kodak coined the term the “Kodak moment”. However, photographers have for some time stretched this idea to visualize time and motion. The photograph in Fig 2 below shows the passing of an entire year [5]. The horizontal axis simultaneously shows two dimensions, space and time, while maintaining a vertical spatial dimension [7]. The time dimension is broken up into four discrete time elements, one for each season. Each time element could be considered an event in the repeating lifecycle of the tree. Since the seasons are cyclical, the artist could have



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26 used this technique to show the continuous passing of time, by repeating spring after winter, or
27 winter before spring [6]. It may be interesting to try combining this static technique with a
28 dynamic representation, for example by showing the branches, leaves, grass, and snow blowing
29 in the wind. Another way to incorporate a dynamic display would be to have the seasons scroll
30 horizontally through the scene, further reinforcing the cyclical nature.



31
32 **Figure 2: Time in photography**

33 A third common example of depiction of events is found in assembly instructions. Graphical
34 instructions for tasks such as baking bread date back to Egyptian times. Effective instructions
35 break down the process into events, with each event representing an action on an object [8]. Each
36 step in an assembly instruction should portray to the user a new object, and the action to take on
37 that object. New computer algorithms are being developed to automatically animate a sequence
38 of events to demonstrate how to assemble objects. The same techniques may also be applicable
39 for automatically generating instructions for new software or user interfaces. Allowing a user to
40 select any given step to animate it may be a useful method of combining static and dynamic
41 techniques.

42 With the increasing proliferation of dynamic visual displays, new options are becoming available
43 for portraying motion, time, and events. This essay has discussed three examples of how both
44 static and dynamic representations can be used to create effective visual designs.

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