

1 **8.1 – Movement Perception; Event Perception**

2 We live in a dynamic world. Moving objects form a large part of our everyday life. It is no surprise that
3 our brain has specialized in detecting motion in the environment and understanding movement of objects
4 (Newell, Wallraven, and Huber 2004). I am going to show that how this special ability of brain can be
5 used in designing visual systems.

6 Study has shown that our perception of movement can help us in identifying objects (Newell et al. 2004).
7 Newell study showed that the movement perception of objects is as effective as other visual hints in
8 categorizing the objects. Result from this study can be used in designing user interfaces for low resolution
9 devices or devices with small graphical display. Such devices have limited power in representing objects
10 with fine details or have small displays which limit them in the amount of detail that they can show on the
11 display. These devices can add motion to the objects on screen with distinct patterns in order to help the
12 user to distinguish and categorize them. This simple trick enables us to represent a larger group of distinct
13 objects without using a lot of graphical details on low end devices.

14 Another use case imaginable for helping categorization and recognition process with movement
15 information is in games. Often we need to render a huge number of objects in a scene in the game and we
16 can't only rely on details about structure and image to help user recognize them because the rendering of
17 scene with such details would be very time consuming and impractical for the gaming purpose. Instead,
18 we can reduce the graphical details and add distinct movement patterns to the objects on the screen to
19 help user recognize objects. This way the system will have a better performance in general.

20 Our brains automatically perform event segmentation in order to better understand and perceive what
21 goes on in the world (Zacks and Swallow 2007). It has been shown that the proper segmentation of event
22 by the user will help him/her in remembering and learning the process (Zacks and Swallow 2007). The
23 role of animation in educational systems and their influence on student learning performance has also
24 been studied by Tversky (Tversky, Morrison, and Betrancourt 2002). Results from this study were
25 inconclusive in suggesting animation as an effective tool for educational since they couldn't find solid
26 improvement just based on animation. We can think of animation as a depiction of a series of events. It is
27 possible that we create educational animation while we considering the event segmentation in our mind.
28 Proper segmentation of educational animation using the clues which is normally used by brain for
29 segmenting an event will help us to provide a better chance for the user to learn and remember events
30 shown in the animation.

31 Knowledge about event segmentation process can also be useful in making decisions about interrupting
32 user. Interaction of the user with the system can be seen as a series of event in which user is trying to
33 achieve a goal in each event. Zacks talks about the relation between event segmentation and working
34 memory updates (Zacks J. M. 2010). He mentions that information that encoded at event boundaries is
35 better remembered. We can use this fact in interrupting user at event boundaries to reduce the interruption
36 cost for the user and create less distraction for the user in interaction with the system. An intelligent user
37 interface can interrupt user when it detects an event has finished and another event is about to start.

38 We used information about how brain processes information about motion and events in designing user
39 interfaces for different scenarios. We talked about how this information will make designed user
40 interfaces more effective.

41 **References**

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