

1 Understanding human scene perception and attention is crucial in designing interfaces that  
2 provide information or notifications to users. In the first section of this essay, we shall investi-  
3 gate how scene perception is used in designing scene details in movies. In the second section,  
4 we look at ad placement strategies. Finally, in the third section, we discuss how scene percep-  
5 tion can be used in designing peripheral alerts for pilots.

## 6 Designing Scene Details in Movies

7 The amount of information (items and their properties) that can be held by our attention is  
8 extremely limited [2]. The *coherence theory* describes a heirarchical representation of the mech-  
9 anism of scene perception. This can be used in designing scenes in movies.

10 For animated movies, rendering detailed objects entails huge modeling and computational  
11 costs. Within the restrictions of time and resources, filmmakers often aim to achieve the greatest  
12 degree of perceived realism. Hence, the parts of the scene which is of most interest (often the  
13 *subject(s)* of the scene) to the viewer is rendered in the greatest detail. Filmmakers get away  
14 with rendering the rest of the scene with reduced details. These include low-fidelity models,  
15 using 2-d image maps for surfaces and repetitive detailing (see Figure 2).

16 This two-level approach is not restricted to the visual details. The action (movement) in  
17 the areas of less interest can be made to be simple and repetitive, without losing the perceived  
18 overall effect. Even traditional filmmakers use this approach in shooting complex scenes (like  
19 battles or cheering crowds). The *extras* often get away with repetitive and unrealistic acting, if  
20 the audience' attention stays with the main characters.

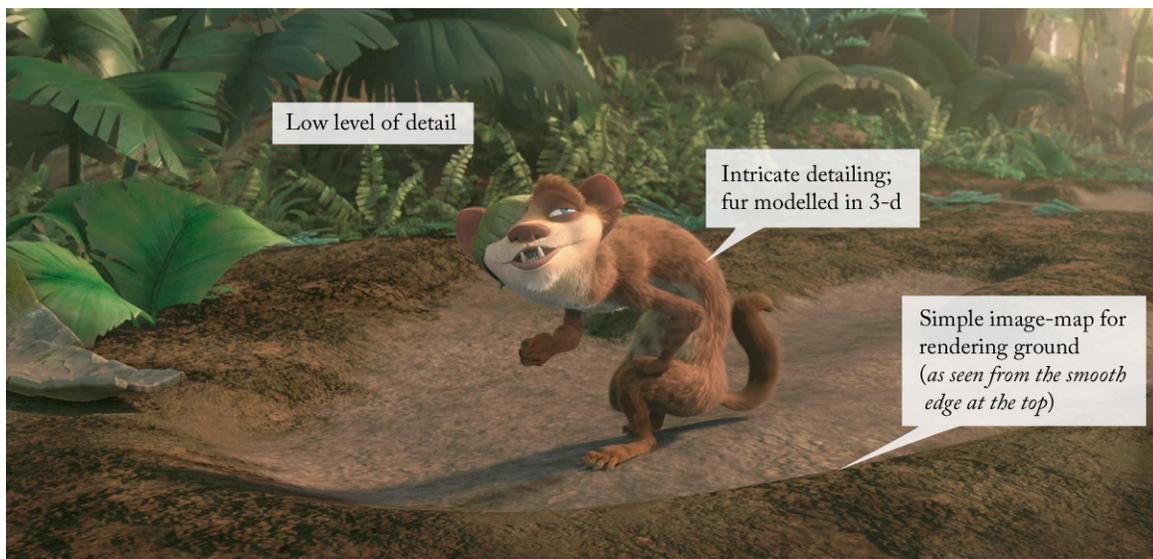


Figure 1: A frame from the movie *Ice Age: Dawn of the Dinosaurs* (2009)

## 21 Ad Placement on Web Pages

22 For ads to be effective, it is necessary for a viewer to pay attention to it. Hence, larger ads are  
23 more sought after (and therefore more expensive). To *grab* a viewers attention, ad designers  
24 use various visual cues: pointers pointing to the ad, motion, bright colors and animation.

25 Change blindness experiments on web pages show effects similar to other areas — viewers  
26 are relatively oblivious to changes outside their region of attention [3]. In one of the experi-  
27 ments, subjects were shown important information (a page link they were looking for) in the  
28 form of a colorful banner which was not close to other link-rich areas of the page. Most of the  
29 subjects failed to notice the link in the banner. Some recent studies have shown that regular  
30 web-readers quickly become resistant to the color and motion cues commonly used by web  
31 ads. This was called “*Banner Blindness*” [4]. These observations suggest that the placement of  
32 an ad on a page is as important (or even more) as the size or other visual properties.



Figure 2: Ad placement in Facebook. The ads are situated in line with other important information.

### 33 **Cockpit Information and Peripheral Alerts**

34 Change detection experiments in aviation cockpits [3] have shown that detection in the periph-  
35 ery is poor. One of the main types of alerts are mode transitions in the primary flight display.  
36 In the study, despite explicit instructions to respond to a specific mode transition as it occurred,  
37 the pilots missed a significant number of mode transitions. The detection was poorest when  
38 the signal change did not result in a significant change in the *gist* of the scene, for example a  
39 change from ON to OFF.

40 Alerts to important changes need to be signaled through changes that are salient in the *gist*  
41 of the visual scene of a pilot. For example, when the mode transitions above were signalled  
42 through a long horizontal light strip (located below the primary display), the mode transition  
43 detection was found to increase [5].

### 44 **Conclusion**

45 Scene perception is very basic in how humans perceive their environment. An understanding  
46 of this system can help designers in creating better visual design. In this essay, I've outlined  
47 three different applications of scene perception in animation for movies, ad placement and  
48 cockpit design.

## 49 **References**

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