

### Animating buttons to show anticipation, action, and reaction

1           Buttons are useful because they give humans direct input into machines. Physical buttons  
2 allow users to operate mechanical or electronic equipment with a tactile sensation. The tactile  
3 sensation of operating a computer keyboard, for example, gives the user confidence that the  
4 inputs are being delivered into the computer. However, since the advent of graphical user  
5 interfaces, the interfaces between users and machines are commonly represented on a computer  
6 screen. The problem with software-based interfaces is that the tactile experience is lost,  
7 particularly with newer touch-screen devices. The loss of tactile feedback can leave the user  
8 confused. Have I successfully pressed the button? How many times have I pressed the button? Is  
9 the system even ready to receive the input? This confusion can be frustrating, but this trouble can  
10 be solved using visual animations. Interface designers can visually indicate the anticipation,  
11 action, and reaction of a button press using texture, luminance, and hue animations.

12           The anticipation of a button press can be visually depicted by animating the texture of the  
13 button. For example, when a button is about to be pressed, its appearance can be changed from a  
14 simple texture to a more complex texture. For interfaces using a computer mouse, the animation  
15 can take place as the mouse hovers over the button (See Fig. 1). This dynamic texture produces  
16 the sensation of the button coming into focus. In this way, the interface shows anticipation of a  
17 button press, and the user can be more confident that their input will be received.

18           In order to provide a positive visual indication of a button press, interface designers can  
19 use luminance shifts. Shifting the luminance of a button during a button press lets users know  
20 when a button is or is not being pressed. This has the advantage of showing users the precise  
21 timing of the onset and offset of an input, and enabling users to distinguish single presses from  
22 double presses. In many cases, the animation of a button press involves a rapid reduction in  
23 luminance. For example, the ‘refresh’ button on the Firefox web browser is light when it is not  
24 engaged, but the luminance is decreased when the button is engaged (See Fig. 2). The visual  
25 indication that a button is being pressed is especially useful for inputs which may not produce  
26 immediate visual results (such as refreshing a web page), but the user needs to be confident that  
27 the input is received.

28           Sometimes users will need to click on strings of text instead of graphical buttons, but it is  
29 not practical to animate text in the same way that the previously described graphical buttons can  
30 be. Text could be difficult to read if the luminance or if the texture of the text changes. To  
31 preserve legibility, hyper-linked text is animated to shift in hue after being clicked. Usually the  
32 text will instantly change from blue to purple when the input is initiated. In addition to indicating  
33 the onset of a click, the shift in hue serves as a permanent indication to the user that the particular  
34 link has been clicked before.

35           Interaction with software on a computer screen can not be as tactile as an interface made  
36 of mechanical switches because screens are designed to display nearly infinite varieties of

37 information, not to register physical inputs. However, designers have utilized the extreme visual  
38 generality of screens to replace tactile experience with a visual one. Animated changes in texture,  
39 luminance, or hue can communicate anticipation, action, and reaction of a button press which  
40 improves the confidence of the user, and improves the interface between humans and machines.

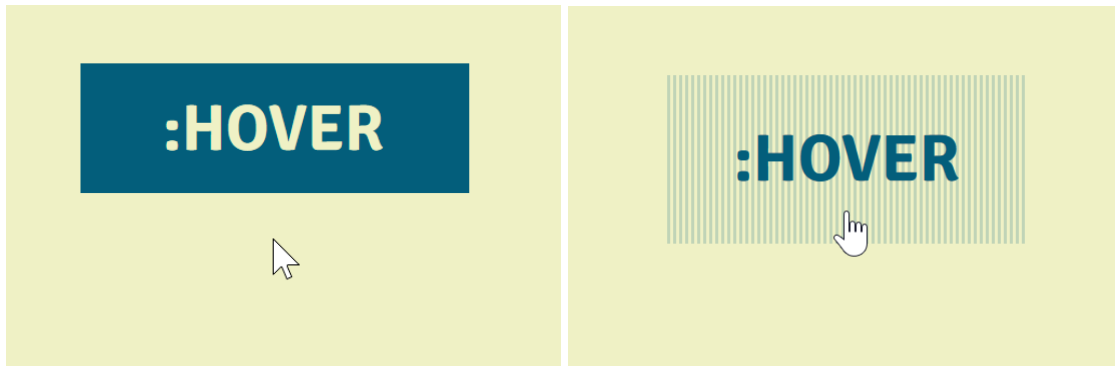


Figure. 1. Left: a button with solid colour. Right: when the mouse hovers over the button, the button shifts from a solid colour to textured indicating it is ready to be pressed.

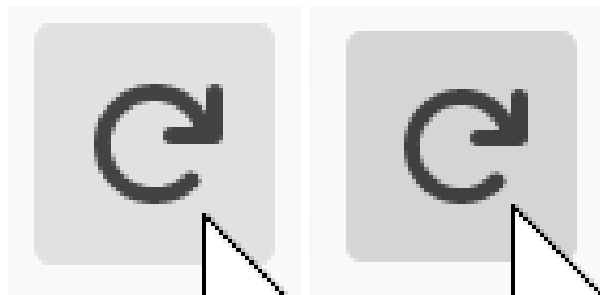


Figure 2. Left: Firefox refresh button not currently pressed. Right: Firefox refresh button being pressed. The button becomes darker when pressed.