Technology

Motion Sensor Applications for Artworks

How to use simple, affordable technology to add movement to sculpture.

It has been my general experience when visiting a museum or gallery show of kinetic artwork that some part or piece will not be working. Most often this is due to mechanical failure from wear or poor maintenance. Based on this experience I now suggest to my clients that their kinetic works be connected to motion sensors which only operate the work in the presence of an observer. This reduces the wear and tear on motors and mechanisms, and extends the life span of the work.

In recent years the basic motion sensor used to turn on exterior lights has become cheap (under $20), readily available, and contains an adjustable timer. These devices will generally have a curved white "eye" which is actually a series of molded fresnel lenses. These lenses focus infrared energy onto the sensor within, creating a broad pattern of narrow beam-like "windows" focused on the sensor. They can only read heat sources like human bodies, (they don't respond to visible light) and are set up so that the warm body has to be in motion (crossing two or three windows) before they will respond. Thus, walking past this fan-like array of windows will produce a more rapid response than walking directly toward it. The same type of device is used in burglar alarms, and is very reliable.

A newer form of this unit made by Intelectron separates the sensor and switch via a radio link. The sensor is a fist-sized box powered by a 9-volt battery, which can be mounted anywhere out of sight, so long as it has a clear view of the trigger area. The primary advantage is that it won't visually interfere with the artwork. Various switch modules are designed to plug into the wall, or wire in as a replacement outlet, and can be concealed within the pedestal or artwork itself. These units are more expensive (about $80 for the pair) but they do have the significant advantage of concealment.

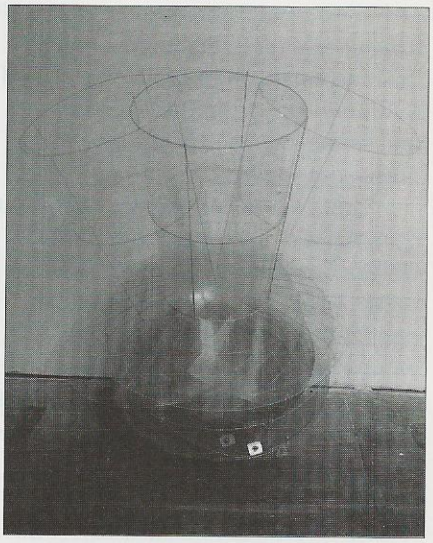
This "invisible sensor" effect means that viewers rarely know that they have activated the work. For instance, Los Angeles-based installation artist Suvan Geer uses this type of sensor to activate a concealed tape player and amplifier. Speakers concealed within the objects in her environments emanate subtle sounds for several minutes at a time. The sounds unobtrusively begin as the viewer enters the room without distracting the viewer. The advantage here is saving wear on the tape and the player mechanism.

These types of units are designed only to switch lights, and have a limit of 100 to 300 watts. In order to utilize them for motors or higher-powered devices, you will need to add a relay. A relay is basically an electrically operated magnet which pulls a switch on when it is powered. While the magnet draws very little power, the switch has the ability to handle more power. To safely wire a relay you will most likely need to find a friendly electrical person with slightly more than basic house wiring experience. I have successfully used these sensors without a relay to power the type of wall module used to power a walkman player, and other small loads.

Recently I helped artist Therese Lahaie to animate a work called "Baby Bouy" (pictured). This is the smallest, at 40 inches tall, of a series of buoy pieces which she has made. Following her concept, they represent channel markers in the ocean of life, guiding individuals to their ultimate destiny. They have been used in a dance performance in which dancers interacted with the buoys, constantly setting them to rocking and spinning.

In an exhibition environment however, Therese needed to find a way to make the work move by itself. I helped her to design a system powered by gel cell batteries. Whenever the internally mounted sensor "sees" a nearby viewer it switches on a DC gear motor (via a relay) which swings a lead weight around in a circle. The moving weight imparts a vigorous motion to the buoy as it starts and stops. The sensor is actually the type used in burglar alarms (available from Radio Shack) which runs on 12-volt battery power, and has the convenient feature of turning on for short periods of time (about 4 seconds). This design has many advantages: limiting the power drain on the batteries, operating only in the presence of the viewer, and limiting wear on the motor. The piece has operated for several days on a 6-amp hour battery due to the minimal power usage. The result is a very dynamic piece which evokes a range of responses from the viewers, who are often seduced into dancing and playing with the buoy.

—Guy Marsden



Above: Therese Lahaie, *Baby Bouy*, 1994. 40 in. tall. Photo: Guy Marsden.

Guy Marsden recently moved to Oakland, California where he consults with artists on technology. His own work includes electronic neon and light sculpture which he exhibits internationally.