

CLAIMS:

1. An interactive object system, comprising:

an infrared emitter that emits infrared light;

an interactive object comprising:

a housing, wherein at least a portion of an exterior surface of the housing comprises a reflector assembly that is in part transparent to the infrared light and is in part reflective of the infrared light;

an optical power harvesting device configured to receive the infrared light through the reflector assembly of the housing and to harvest power from the received infrared light; and

a special effect system disposed in or on the housing that receives power from the optical power harvesting device to power one or more effects of the interactive object;

a detector that detects reflected infrared light from the reflector assembly;

and

a controller that controls operation of the infrared emitter and that receives data indicative of the reflected infrared light from the detector.
2. The system of claim 1, wherein the housing of the interactive object comprises a wand, and wherein the reflector assembly is disposed on a tip of the wand.
3. The system of claim 1, wherein the infrared emitter comprises a first infrared light source that emits the infrared light in a first wavelength range and a second infrared light source that emits additional infrared light in a second wavelength range.

4. The system of claim 3, wherein the second infrared light source is a near infrared laser.

5. The system of claim 3, wherein the infrared light is in a range of 800nm-1550nm.

6. The system of claim 3, wherein the first wavelength range and the second wavelength range are different.

7. The system of claim 3, wherein the controller is programmed to activate the second infrared light source based on the data indicative of the reflected infrared light from the detector.

8. The system of claim 7, wherein the first infrared light source is continuously active.

9. The system of claim 1, wherein the reflected infrared light is in a same wavelength range as the received infrared light from which the optical power harvesting device harvests power.

10. The system of claim 9, wherein the reflected infrared light is in a range of about 850nm to about 940nm and the received infrared light at the optical power harvesting device is at least 1000nm.

11. The system of claim 1, wherein the special effect system comprises a haptic feedback device, wherein the haptic feedback device is configured to be activated in response to the optical power harvesting device harvesting power from the received infrared light.

12. The system of claim 1, wherein the special effect system comprises a light source configured to be activated to shine light from the housing in response to the optical power harvesting device harvesting power from the received infrared light.

13. The system of claim 1, wherein the special effects system comprises:

a plurality of sensors disposed on the exterior surface of the interactive object in a region corresponding to a grip portion; and

an object controller disposed on or in the housing that is programmed to:

receive signals from the plurality of sensors;

identify a grip of a user holding the interactive object based on the signals; and

generate a control signal to the special effect system based on the identified grip.

14. The system of claim 13, wherein the special effects system further comprises a haptic feedback device, a light source, or both, that are activated in response to the generated control signal.

15. The system of claim 1, wherein the reflector assembly comprises a material that is transparent to the infrared light and at least partially opaque to visible light.

16. An interactive object method, comprising:

emitting first electromagnetic radiation, using a first light source, into an area;

detecting the electromagnetic radiation reflected back from a retroreflective material in the area, wherein the retroreflective material is disposed on an interactive object;

determining a location of the retroreflective material based on the detected electromagnetic radiation; and

emitting second electromagnetic radiation, using the first light source or a second light source, towards the location to activate a special effect of the interactive object using power harvested from the second electromagnetic radiation.

17. The method of claim 16, wherein the first light source is an infrared light source and the second light source is an infrared laser light source.

18. The method of claim 16, comprising focusing the second light source to emit the second electromagnetic radiation based on the location.

19. The method of claim 18, wherein focusing the second light source comprises focusing on a portion of the interactive object based on a known relationship between the location of the retroreflective material and a position of a material on the interactive object through which the second electromagnetic radiation penetrates to reach a power harvesting device to activate the special effect of the interactive object.

20. An interactive object, comprising:

a power harvesting device, wherein the power harvesting device harvests power from electromagnetic radiation;

a housing within which the power harvesting device is disposed, the housing comprising: a reflector assembly that transmits the electromagnetic radiation through a first portion of the reflector assembly to the power harvesting device and that reflects the electromagnetic radiation to an external detector from a second portion of the reflector assembly, wherein the first portion comprises a transmissive material and wherein the second portion comprises a retroreflective material; and

a special effect system that is powered by the harvested power from the power harvesting device.