CLAIMS

1. A show effect system of an amusement park, the show effect system comprising:

an enclosure;

an interaction space within the enclosure, wherein the interaction space is configured to receive an object;

a display system configured to present imagery;

an adjustable beam splitter positioned to enable visibility from a viewing portion:

into the interaction space through the adjustable beam splitter; and

of the imagery via reflection off the adjustable beam splitter;

a sensor configured to monitor the interaction space and provide sensor data related to the object within the interaction space; and

one or more controllers communicatively coupled to the sensor and the display system, wherein the one or more controllers are configured to perform operations comprising:

determining one or more parameters of the object and an identifier on the object based on the sensor data;

determining a type of the object based on the identifier on the object;

generating image data based on at least one parameter of the one or more parameters of the object and the type of the object;

instructing transmittal of the image data to the display system; and

instructing the display system to present the imagery based on the image data.

2. The show effect system of claim 1, comprising an additional sensor configured to monitor eye movement of a guest in the viewing portion, wherein the additional sensor is communicatively coupled to the one or more controllers and configured to transmit additional sensor data indicative of the eye movement of the guest.

3. The show effect system of claim 2, comprising an actuator coupled to the adjustable beam splitter and communicatively coupled to the one or more controllers, wherein the one or more controllers are configured to instruct the actuator to adjust an orientation and/or position of the adjustable beam splitter relative to the display system based on the additional sensor data.

4. The show effect system of claim 1, wherein the one or more controllers are configured to:

determine a size or a position of the object based on the sensor data; and

generate or adjust the imagery based on the size or the position of the object.

5. The show effect system of claim 1, wherein the enclosure comprises one or more apertures that expose the interaction space to an external environment for access to the interaction space.

6. The show effect system of claim 1, wherein the interaction space comprises one or more reflective markers, and wherein the one or more controllers is configured to:

determine a location of the object based on at least one distance measure between the object and at least one reflective marker of the one or more reflective markers.

7. The show effect system of claim 1, wherein the one or more controllers is configured to:

determine a target location of one or more virtual images of the imagery to be presented by the display system onto the adjustable beam splitter based on the one or more parameters of the object; and

instruct the display system to present the one or more virtual images based on the target location.

8. The show effect system of claim 7, wherein the one or more parameters comprises a relative distance between the object and the adjustable beam splitter.

9. The show effect system of claim 1, comprising an actuatable cover set comprising one or more actuatable first covers extending over the adjustable beam splitter and one or more actuatable second covers on one or more lateral sides of the enclosure, wherein the actuatable cover set is configured to reduce or block ambient light directed onto the adjustable beam splitter.

10. A non-transitory computer-readable medium, comprising instructions that, when executed by one or more processors, are configured to cause the one or more processors to perform operations comprising:

receiving user input indicative of one or more guest preferences;

determining one or more characteristics of a viewer based on sensor data from one or more sensors monitoring a viewing location of a show effect system;

determining one or more parameters of an object disposed within an interaction area of the show effect system based on additional sensor data received from one or more additional sensors monitoring the interaction area, wherein the object is visible from the viewing location as a transmitted element through a beam splitter;

instructing one or more actuators to adjust an orientation or position of the beam splitter based on the sensor data;

generating image data based on the one or more parameters of the object and the one or more guest preferences; and

instructing a display system to project one or more virtual images onto the beam splitter based on the image data to cause the one or more virtual images to be visible, from the viewing location, via reflection off the beam splitter as a reflected element that overlaps with the transmitted element.

11. The non-transitory computer-readable medium of claim 10, wherein the instructions, when executed by the one or more processors, are configured to cause the one or more processors to perform operations comprising:

determining one or more types of the object based on one or more identifiers on the object detected based on the additional sensor data; and

generating the image data associated with the one or more types of the object.

12. The non-transitory computer-readable medium of claim 10, wherein the instructions, when executed by the one or more processors, are configured to cause the one or more processors to perform operations comprising:

determining movement of the object from a first position within the interaction area to an additional position within the interaction area; and

updating the image data based on the additional position of the object within the interaction area.

13. The non-transitory computer-readable medium of claim 10, wherein instructing the display system to project the one or more virtual images onto the beam splitter comprises:

instructing a first display of the display system to project a first virtual image of the one or more virtual images onto the beam splitter; and

instructing a second display of the display system to project a second virtual image of the one or more virtual images onto the beam splitter, wherein the first virtual image and the second virtual image overlap to form the reflected element.

14. The non-transitory computer-readable medium of claim 10, wherein the instructions, when executed by the one or more processors, are configured to cause the one or more processors to perform operations comprising:

determining a line of sight of the viewer in the viewing location based on the sensor data; and

instructing the one or more actuators of the beam splitter to move and/or orient the beam splitter based on the line of sight of the viewer in the viewing location.

15. An attraction system for an attraction, the attraction system comprising:

an enclosure comprising a beam splitter that defines an interaction space and a viewing portion within the enclosure, wherein the interaction space is configured to receive an object, the viewing portion comprises a three-dimensional display system configured to project one or more virtual images onto the beam splitter, and the beam splitter is configured to enable visibility of the object within the interaction space through the beam splitter and to enable visibility of the one or more virtual images projected onto the beam splitter via reflection off the beam splitter;

a cover configured to at least partially enclose the viewing portion;

one or more sensors configured to track movement of the object and determine an intensity of light directed towards the beam splitter, wherein the object is disposed within the interaction space; and

a controller configured to:

receive sensor data from the one or more sensors, wherein the sensor data is indicative of the movement of the object disposed within the interaction space and/or the intensity of light directed towards the beam splitter;

instruct an actuator to adjust a position of the cover with respect to the beam spli based on a comparison between the intensity of light and a threshold intensity of light;

generate image data based on the movement of the object disposed within the interaction space as indicated by the sensor data; and

instruct the three-dimensional display system to project the one or more virtual images onto the beam splitter based on the image data to cause the one or more virtual images to combine to form an illusion of a three-dimensional image and be visible via the reflection off the beam splitter at a first location of visibility that is based on a second location of the visibility of the object through the beam splitter.

16. The attraction system of claim 15, comprising one or more additional actuators, wherein the controller is configured to instruct the one or more additional actuators to move and/or orient the beam splitter within the enclosure.

17. The attraction system of claim 16, comprising one or more additional sensors configured to determine one or more parameters indicative of a position of a user relative to the beam splitter, wherein the controller is configured to instruct the one or more additional actuators to move and/or orient the beam splitter within the enclosure based on the position of the user relative to the beam splitter.

18. The attraction system of claim 15, wherein the controller is configured to instruct the three-dimensional display system to project at least one virtual image of the one or more virtual images onto

the beam splitter to overlap the first location of visibility of the one or more virtual images via the reflection off the beam splitter with the second location of visibility of the object through the beam splitter.

19. The attraction system of claim 15, comprising a light emitter positioned within the interaction space and configured to emit light, wherein the controller is configured to:

instruct the light emitter to emit light in response to determining an amount of light within the interaction space is less than a threshold amount of light.

20. The attraction system of claim 15, wherein the controller is configured to:

instruct the actuator to extend the cover in a longitudinal direction such that the cover overlaps with the beam splitter in response to determining the intensity of light is greater than the threshold intensity of light.