

SYSTEM AND METHOD FOR TIDAL CHANGE SIMULATION

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to and the benefit of U.S. Provisional Application No. 63/525,299, entitled “SYSTEM AND METHOD FOR TIDAL CHANGE SIMULATION” filed July 6, 2023, which is hereby incorporated by reference in its entirety for all purposes.

BACKGROUND

[0002] This section is intended to introduce the reader to various aspects of art that may be related to various aspects of the present techniques, which are described and/or claimed below. This discussion is believed to be helpful in providing the reader with background information to facilitate a better understanding of the various aspects of the present disclosure. Accordingly, it should be understood that these statements are to be read in this light, and not as admissions of prior art.

[0003] Throughout amusement parks and other entertainment venues, special effects can be used to help immerse guests in the experience of a ride or attraction. Immersive environments may include three-dimensional (3D) props and set pieces, robotic or mechanical elements, and/or display surfaces that present media. For example, an attraction system may provide a beach effect by pumping water through a wave generator in a swimming pool with a beach entry. However, such effects may be expensive, complex, and provide an unreliable experience for guests. Moreover, with increased sophistication and complexity of modern attractions and a corresponding increase in expectations among amusement park (e.g., theme park) guests, improved and more creative attractions are desirable, including show effects having immersive, and/or realistic characteristics.

SUMMARY

[0004] A summary of certain embodiments disclosed herein is set forth below. It should be understood that these aspects are presented merely to provide the reader with a brief summary of these certain embodiments and that these aspects are not intended

to limit the scope of this disclosure. Indeed, this disclosure may encompass a variety of aspects that may not be set forth below.

[0005] In an embodiment, a show effect system of an amusement park may include a platform positioned within a reservoir and configured transition between configurations to control submersion and extraction of at least a portion of the platform with respect to a liquid disposed within the reservoir, a reservoir entry that provides guest access to the reservoir, where a first side of the platform is adjacent the reservoir entry, a fluid source coupled to one or more inflatables and configured to control fluid flow into and out of the one or more inflatables, where the one or more inflatables are coupled to a second side of the platform opposite the first side, one or more hinges coupling the first side of the platform to a structure of the reservoir, and a controller communicatively coupled to the fluid source. The controller may instruct the fluid source to inject fluid into or extract the fluid from the one or more inflatables to lift or lower the second side and rotate the platform about the one or more hinges such that the platform transitions from a first configuration with a first level of platform submersion in the liquid to a second configuration with a second level of platform submersion in the liquid, wherein the first level of submersion is different than the second level of submersion.

[0006] In an embodiment, a show effect system of an amusement park may include a platform positioned within a reservoir and configured transition between configurations to control submersion and extraction of at least a portion of the platform with respect to a liquid disposed within the reservoir, a first side of the platform coupled to a structure of the reservoir via one or more hinges, and a second side of the platform opposite the first side. The show effect system may also include an actuation system coupled to the second side of the platform and a controller communicatively coupled to the actuation system and configured to instruct the actuation system to lift or lower the second side such that the platform is rotated about the one or more hinges such that the platform transitions from a first configuration with a first level of platform submersion in the liquid to a second configuration with a second level of platform submersion in the liquid, where the first level of submersion is different than the second level of submersion.

[0007] In an embodiment, an attraction system for an attraction may include a platform coupled to one or more objects and positioned within a reservoir, a sensor configured to transmit sensor data indicative of information corresponding to the guest, and at least one actuator coupled to the platform and configured to adjust the position of the platform between the first configuration and the second configuration. The attraction system may also include a controller coupled to the sensor and the at least one actuator, where the controller is configured to instruct the at least one actuator to adjust the position of the platform based on the sensor data. In a first configuration, a first portion of the platform is positioned within liquid disposed in the reservoir and not directly visible to a guest and a second portion of the platform is extracted from the liquid and directly visible to the guest and in a second configuration, at least some of the first portion of the platform is exposed from the liquid along with the second portion of the platform.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] These and other features, aspects, and advantages of the present disclosure will become better understood when the following detailed description is read with reference to the accompanying drawings in which like characters represent like parts throughout the drawings, wherein:

[0009] FIG. 1 is a schematic diagram of an embodiment of an attraction system including a show effect system, in accordance with an aspect of the present disclosure;

[0010] FIG. 2 is a schematic diagram of an embodiment of the attraction system of FIG. 1 including the show effect system, in accordance with an aspect of the present disclosure;

[0011] FIG. 3 is an overhead view of an embodiment of the attraction system of FIG. 1 including the show effect system, in accordance with an aspect of the present disclosure;

[0012] FIG. 4 is an overhead view of an embodiment of the attraction system of FIG. 1 including the show effect system, in accordance with an aspect of the present disclosure; and

[0013] FIG. 5 is a flowchart of a method or process for providing a show effect within the attraction system of FIG. 1, in accordance with an aspect of the present disclosure.

DETAILED DESCRIPTION

[0014] When introducing elements of various embodiments of the present disclosure, the articles “a,” “an,” and “the” are intended to mean that there are one or more of the elements. The terms “comprising,” “including,” and “having” are intended to be inclusive and mean that there may be additional elements other than the listed elements. Additionally, it should be understood that references to “one embodiment” or “an embodiment” of the present disclosure are not intended to be interpreted as excluding the existence of additional embodiments that also incorporate the recited features.

[0015] One or more specific embodiments of the present disclosure will be described below. In an effort to provide a concise description of these embodiments, all features of an actual implementation may not be described in the specification. It should be appreciated that in the development of any such actual implementation, as in any engineering or design project, numerous implementation-specific decisions must be made to achieve the developers’ specific goals, such as compliance with system-related and business-related constraints, which may vary from one implementation to another. Moreover, it should be appreciated that such a development effort might be complex and time-consuming, but would nevertheless be a routine undertaking of design, fabrication, and manufacture for those of ordinary skill having the benefit of this disclosure.

[0016] The present disclosure is directed to a tidal change effect that emulates a wave ebbing and flowing along a shoreline of a body of water (e.g., a pond, an ocean, a lake, a lagoon, a river, a man-made reservoir, a pool) and the like. A reservoir may be utilized to represent any type of body of water and may include a natural or man-made body of water. The tidal change effect may emulate a rising and/or falling tide. For example, the tidal change effect may mimic a falling tide by causing water to appear to recede from a shoreline to reveal features of a beach, such as pebbles, shells, seaweed, and the like. The tidal change effect may also mimic a rising tide by causing

water to appear to advance on the shoreline to cover the referenced features. In this way, the tidal change effect may emulate water (e.g., waves) ebbing and flowing at the shoreline to create an immersive experience and/or realistic experience for a guest.

[0017] Embodiments of the present disclosure are directed to a show effect system of an attraction system that provides a tidal change effect by adjusting a position and/or an orientation of a platform within a liquid reservoir. For example, a guest may stand on a portion of the platform that may be exposed from the liquid reservoir or at least extend out of the liquid disposed in the liquid reservoir. The platform may include one or more objects (e.g., pebbles, shells, seaweed) coupled to or positioned on a surface of the platform that may not be viewable by the guest in a first configuration. For example, an additional portion of the platform may be submerged in the liquid reservoir, which may hide the one or more objects from a guest's perspective. As such, the one or more objects may be positioned under water and out of a line of sight of guests. The platform may be coupled to one or more airbag(s) and one or more hinge(s) that adjust the position and/or the orientation of the platform from the first configuration to a second configuration. In particular, adjustment of the platform via the one or more inflatable(s) and one or more hinge(s) may transition the portion of the platform out of the liquid reservoir and into the line of sight of the guest. Transitioning from the first configuration to the second configuration, may cause the liquid originally covering the portion of the platform to visually appear to recede and expose both the portion of the platform and the one or more objects. The transition may occur at such a rate that the platform may not be perceived (e.g., felt) to be moving by the guest. In certain instances, the platform may be coupled to one or more actuator(s) to transition the platform between the first configuration and the second configuration. In this way, the show effect system may emulate a tide receding from the shoreline or a falling tide. Similarly, the reverse operation may simulate a tide advancing over the shoreline or a rising tide. These simulations of tidal actions (or other such simulated water-related activity) may be achieved by raising and/or lowering respective portions of the platform relative to a waterline of a liquid reservoir that actually remains stationary.

[0018] With the preceding in mind, FIG. 1 is a schematic diagram of an embodiment of an attraction system 50 of an amusement park. The attraction system 50 may include a guest area 52 with one or more guest(s) 54 and a liquid reservoir 55 positioned therein

and a show effect system 56, which may be viewable and potentially accessible from the guest area 52. As an example, the guest area 52 may include a path (e.g., a walkway, a queue, a line) or an open space through which the guest(s) 54 may pass. As another example, the guest area 52 may include a space (e.g., a seating area) where the guest(s) 54 may be positioned to view a performance. As a further example, the guest area 52 may include a ride vehicle that may move and carry the guest(s) 54 throughout the attraction system 50.

[0019] The guest area 52 may include a liquid reservoir 55 that holds liquid for a show effect. For example, the liquid reservoir 55 may hold fresh water, deionized water, salt water, dyed water or the like for the show effect. The liquid reservoir 55 may also include a system for monitoring conditions of the liquid and/or filtering the liquid before, during, and/or after generation of the show effect. For example, the liquid reservoir 55 may include a sensor 57 for monitoring liquid conditions. The liquid reservoir 55 may also include a filter system 59 for filtering the liquid, such as a filtration system, a chlorination system, a reverse osmosis system, or the like for filtering the liquid. For example, the filter system 59 may periodically filter the liquid to remove dirt, debris, bacteria, and the like. While the liquid reservoir 55, the sensor 57, and/or the filter system 59 are depicted as fully located in the guest area 52 in the illustrated attraction system 50, the liquid reservoir 55, the sensor 57, and/or the filter system 59 may be at least partially located within the show effect system 56 in accordance with present embodiments, as indicated by arrow 61.

[0020] The attraction system 50 may also include the show effect system 56, which may be operated to provide entertainment to the guest(s) 54 located in the guest area 52 and/or within the attraction system 50. For instance, the show effect system 56 may create show effects (e.g., visual effects, interactive effects) that are viewable by the guest(s) 54 within the attraction system 50. The show effect may be a tidal change effect that emulates a water (e.g., tidal wave) ebbing and flowing along a shoreline to hide and/or reveal features of the shoreline. For example, the shoreline may include features such as sand, rocks, seaweed, geological features, biological features, and the like. In certain instances, the show effect may be activated in response to guest input, thereby providing entertainment for the guest(s) 54. In other instances, the show effect may be activated based on operator input as part of an attraction and/or ride. To this

end, the show effect system 56 may include a platform 58, one or more object(s) 60, one or more hinges 66, one or more inflatable(s) 62, one or more sensor(s) 70, and one or more actuator(s) 68 to generate and provide the show effect to the guest(s) 54. Although the show effect system 56 is depicted as located outside of the guest area 52 in the illustrated attraction system 50, as indicated by the arrow 61, the show effect system 56 may be at least partially located within the guest area 52 in an additional or an alternative attraction system 50.

[0021] The platform 58 may be a flat structure that may be at least partially immersed into and at least partially extracted out of the liquid reservoir 55 over periods of time. For example, the platform 58 may be a fiberglass structure, a stainless steel structure, a mild steel structure, a concrete structure, and the like that may tolerate being in the liquid. The platform 58 may act as a floating dock in the liquid reservoir 55 and support the one or more guest(s) 54 during the show effect. The platform 58 may be any suitable shape or size to accommodate the one or more guest(s) 54. For example, the platform 58 may be rectangular or oblong with a length and a width greater than ten feet to support the one or more guest(s) 54. The platform 58 may visually appear to be a bridge between two attractions within the attraction system 50. In a first configuration, the platform 58 may be angled into the liquid reservoir 55 such that a portion of the platform 58 is immersed in the liquid of the liquid reservoir 55, which may create a visual appearance of a body of water separating the two attractions and hiding the bridge from the guest's perspective. In a second configuration, a position and/or orientation of the platform 58 may be adjusted to cause the immersed portion to be extracted, causing the liquid to effectively recede and reveal the pathway between the two attractions. In a similar embodiment, the platform 58 may include two portions that are coupled at a hinge such that each portion slopes into the liquid reservoir 55 from a respective one of the attractions in the first configuration (such that the hinge coupling the two portions is submerged in the liquid) and each portion may then be lifted out of the liquid reservoir 55 in the second configuration. In another example, the platform 58 may be another shape (e.g., a rounded shape, such as a circle with any suitable radius) to support the one or more guest(s) 54. In a first configuration, the platform 58 may appear to be an island surrounded by a body of water within the attraction system 50. In the first configuration, a portion of the platform 58 may be disposed under the liquid of the liquid reservoir 55, which appears as the body of water.

In a second configuration, the platform 58 may be adjusted such that hidden features on the platform 58 may be revealed, thereby emulating water ebbing away from the island. The platform 58 may be extracted almost fully to create a pathway to the guest area 52 (e.g., a peninsula).

[0022] The platform 58 may be coupled to the one or more object(s) 60 to create an immersive experience for the one or more guest(s) 54. For example, the one or more object(s) 60 may include actual features including or props representing things like foliage, such as shrubbery, trees, bushes, flowers, or the like to hide a side (e.g., edge) of the platform 58 from the guest's perspective and/or to create an appearance of a pathway. In another example, the one or more object(s) 60 may include actual features including or props representing sand, soil, pebbles, rocks, seaweed, grass, geological characteristics, biological characteristics, and the like to create a visual appearance of a shoreline for the guest(s) 54. Still in another example, the object(s) 60 may include a pathway for the guest(s) 54 to traverse from a first location to a second location within the attraction system 50. The one or more object(s) 60 may be coupled (e.g., bonded) to the platform 58 by an adhesive, such as epoxy, to prevent movement of the one or more object(s) 60 during the show effect and/or immersion within the liquid reservoir 55. The one or more object(s) 60 may be also be imprinted or otherwise integrated into the platform 58. For example, the one or more object(s) 60 may be painted, sculpted, etched, laser cut, or the like into the platform 58.

[0023] The platform 58 may also be coupled to one or more inflatable(s) 62 that support the platform 58 before, during, and after the show effect. In addition, the one or more inflatable(s) 62 may adjust a position and/or an orientation (e.g., configuration) of the platform 58. The one or more inflatable(s) 62 (e.g., airbags, air-tight bags) may be made of rubber (or another material capable of retaining fluid for inflation purposes) and may be inflated and/or deflated by a fluid source 64. For example, the fluid source 64 may include one or more pump(s) that inject fluid into the one or more inflatable(s) 62 and/or one or more reverse pump(s) that extract fluid from the one or more inflatable(s) 62. That is, the fluid source 64 may control fluid flow into and/or out of the one or more inflatable(s) 62. For example, the one or more inflatable(s) 62 may be inflated (e.g., via the fluid source 64) to push the platform 58 out of the liquid reservoir 55 (e.g., upwards in a vertical direction) and deflated to move the platform 58 into the

liquid reservoir 55 (e.g., downwards in the vertical direction). In other words, the inflatable(s) 62 may inflate and transition the platform 58 from the first configuration to the second configuration and deflate to transition the platform 58 from the second configuration to the first configuration. To this end, the fluid source 64 may provide fluid (e.g., compressed air) to inflate the inflatable(s) 62 and/or remove fluid from the inflatable(s) 62 for deflation. For example, the fluid source 64 may provide (e.g., inject) air, carbon dioxide gas, nitrogen gas, oxygen gas, water, hydraulic fluid, and so on. Each of the one or more inflatable(s) 62 may be inflated to any suitable pressure level, such as 100 pounds per square inch (PSI). Further, each of the one or more inflatable(s) 62 may support more than one ton of weight. As such, the one or more inflatable(s) 62 may support the weight of the platform 58 and/or the weight of guest(s) 54 interacting with the show effect system 56. For example, the platform 58 may weigh up to ten to fifteen tons and each inflatable 62 coupled to the platform 58 may support up to five tons of weight. In certain instances, the platform 58 may be coupled to and supported by three or more inflatable(s) 62. Additionally, the inflatable(s) 62 may support additional weight and/or force exerted by the liquid within the liquid reservoir 55.

[0024] In addition, the platform 58 may be coupled to one or more hinge(s) 66 that adjusts a position and/or an orientation (e.g., configuration) of the platform 58. For example, the one or more hinge(s) 66 may be coupled to a side (e.g., edge) of the platform 58 opposite side of the platform 58 coupled to the inflatable(s) 62. When the one or more inflatable(s) 62 inflate, the one or more hinge(s) 66 may extend to push and/or rotate the platform 58 out of the liquid reservoir 55. When the one or more inflatable(s) 62 deflate, the one or more hinge(s) 66 may pull and/or rotate the platform 58 back into the liquid reservoir 55. The one or more hinge(s) 66 may include ball-bearing hinges, butt hinges, butterfly hinges, constant torque hinges, ball and socket joint, hinge joint, saddle joints, and the like. The one or more hinge(s) 66 may include any suitable hinge that may be submerged in the liquid reservoir 55 over the periods of time. In addition, the one or more hinge(s) 66 may support a weight of the platform 58 and/or aid the movement of the one or more inflatable(s) 62.

[0025] The platform 58 may also be coupled to one or more actuator(s) 68 that adjust a position and/or an orientation (e.g., configuration) of the platform 58. For example, the one or more actuator(s) 68 may operate using a linear movement, a rotational

movement, or both to adjust the configuration of the platform 58. To this end, the one or more actuator(s) 68 may include a hydraulic actuator, a mechanical lift, a linear actuator, a rotational actuator, a cammed mechanical device, and the like. For example, the one or more actuator(s) 68 may cause a simple linear movement of the platform 58, such as moving the platform 58 in a vertical direction to cause the liquid to move across the surface of the platform 58. In another example, a first actuator 68 coupled to the platform 58 may be a spherical actuator using rotational movement and a second actuator 68 coupled to the platform 58 may be a linear actuator using linear motion. Using two actuators 68 with different types of movement may reduce static friction within each of the actuators 68 during the show effect. Additionally, a third actuator 68 may be coupled to the platform 58 and may be a linear actuator to stabilize movement of the platform 58 during the show effect. The one or more actuator(s) 68 may include any suitable actuator 68 that may be submerged in the liquid reservoir 55 over the periods of time. The one or more actuator(s) 68 may include a weak knee actuator, a pneumatic cylinder, a hydraulic actuator, an electric motor, a co-linear hinge, a camshaft actuator, a stainless steel with plastic bearing (e.g., non-hydroscopic bearing), a non-hydroscopic actuator, and so on. For example, the actuator 68 may be a weak knee actuator such that pulling the actuator 68 may lower the platform 58 and releasing the actuator 68 may raise the platform 58. The one or more actuator(s) 68 may be coupled to the liquid reservoir 55. For example, the one or more actuator(s) 68 may be mounted to a pillow block that provides support during the show effect. The pillow block may be considered part of the actuator 68.

[0026] The show effect system 56 may also include the one or more sensor(s) 70. The one or more sensor(s) 70 may generate sensor data of the guest(s) 54 and transmit sensor data to a controller 74. The one or more sensor(s) 70 may include an optical sensor (e.g., camera, infrared camera), a light detection and ranging (LiDAR) sensor, a sonar sensor, or the like that tracks a position and/or a movement of the guest(s) 54. For example, the one or more sensor(s) 70 may track a movement and/or a position of the guest(s) 54 (including gestures, head positioning, viewing orientation, and the like). In another example, the one or more sensor(s) 70 may track a number of guest(s) 54 being supported by the platform 58.

[0027] The show effect system 56 may include a controller 74 (e.g., an automation controller, a programmable controller, a programmable logic controller, an electronic controller, control circuitry, a cloud-computing system) that operates the show effect system 56 to provide the immersive and/or interactive experience to the guest(s) 54. In certain instances, the controller 74 may include one or more controller(s) 74 that individually or collectively perform operations to generate the show effect. For example, the controller 74 may be communicatively coupled (e.g., via one or more wires, via wireless communication (e.g., via transmitters, receivers, transceivers)) to the fluid source 64, the one or more actuator(s) 68, the one or more sensor(s) 70, or the like. The controller 74 may include a memory 76 and processing circuitry 78. The memory 76 may include volatile memory, such as random access memory (RAM), and/or non-volatile memory, such as read-only memory (ROM), optical drives, hard disc drives, solid-state drives, or any other non-transitory computer-readable medium that includes instructions to operate the attraction system 50. The processing circuitry 78 may be configured to execute such instructions. For example, the processing circuitry 78 may include one or more application specific integrated circuits (ASICs), one or more field programmable gate arrays (FPGAs), one or more general purpose processors, or any combination thereof.

[0028] For example, the controller 74 may receive sensor data and/or user input indicative of generating the show effect and cause generation of the show effect. For example, the controller 74 may receive the sensor data and determine the number of guest(s) 54 being supported the platform 58 and/or positioned adjacent to the platform 58. The platform 58 may be in the first configuration such that a portion of the platform 58 may be submerged in the liquid reservoir 55. That is, from the guest's perspective, the show effect system 56 may appear as a shallow beach with the liquid hiding the one or more object(s) 60 and/or a portion of the platform 58. For example, the guest(s) 54 may perceive the platform 58 as a shoreline and the liquid reservoir as a body of water. If the number of guest(s) 54 is greater than a threshold number, then the controller 74 operates to transmit a control signal to instruct the one or more actuator(s) 68 to adjust the configuration of the platform 58 and/or the fluid source 64 to inflate the one or more inflatable(s) 62 from the first configuration to the second configuration. For example, the one or more actuator(s) 68 may be instructed by the controller 74 and operate to move the platform 58 upwards in the vertical direction, thereby exposing the submerged

portion of the platform 58 to the guest's perspective. In another example, the fluid source 64 may operate to provide fluid and inflate the one or more inflatable(s) 62. Adjusting the position and/or orientation of the platform 58 in this way may expose the one or more object(s) 60 coupled to the platform 58 to the guest's perspective, thereby emulating a wave receding from a shoreline or a transition to low tide. The actuator(s) 68 and/or the one or more inflatable(s) 62 may adjust the position of the platform 58 at a rate such that the guest(s) 54 may not perceive (e.g., feel) any movement. As such, the guest(s) 54 may perceive the gradually exposed platform 58 as a tidal wave receding (e.g., ebbing) from a shoreline.

[0029] After a period of time or based on an input (e.g., in response to monitored activity), the controller 74 may transmit an additional control signal to the one or more actuator(s) 68 to adjust the platform 58 from the second configuration to the first configuration. For example, the one or more actuator(s) 68 may lower the platform 58 in the vertical direction such that the liquid covers the portion of the platform 58 and/or the one or more object(s) 60. In another example, the fluid source 64 may remove (e.g., extract) fluid from the inflatable(s) 62 for deflation, which may cause the platform 58 to lower. Indeed, the actuator(s) 68 and/or the one or more inflatable(s) 62 may transition the platform 58 at a rate that may not be perceivable by the guest(s) 54. As the liquid covers the platform 58, the guest(s) 54 may perceive a tidal wave flowing across the shoreline. In this way, the show effect may emulate a rising tide or wave flowing over a shoreline (e.g., beach area).

[0030] In another example, the controller 74 may receive the sensor data and determine if a movement of the one or more guest(s) 54 corresponds to one or more movement templates stored in the memory 76. That is, the memory 76 may store one or more movement templates (e.g., gestures or transitions to a location) that when performed by the guest(s) 54 trigger generation of the show effect. To this end, the controller 74 may use image analysis techniques, machine learning techniques, and the like to identify the movement within the sensor data. For example, the guest(s) 54 may participate in a quest within the attraction system 50 and perform an action and/or a movement to cause activation of the show effect. If the guest(s) 54 performs a movement corresponding to one or more movement templates in the memory 76, then the controller 74 may transmit a control signal to the one or more actuator(s) 68 and/or

the fluid source 64 to cause generation of the show effect. The one or more object(s) 60 may include a pathway for the guest(s) 54 to traverse and the configuration of the platform 58 may reveal the pathway to the guest(s) 54. That is, the platform 58 may transition into a configuration that positions a pathway on the platform 58 above the liquid in the liquid reservoir 55 such that the pathway is visible and accessible to the guest(s) 54. After a period of time or based on an input (e.g., confirmation from the sensor 70 or a user input device that the guest(s) have traversed a revealed pathway), the show effect system 56 may reset to an initial configuration (e.g., first configuration) by transmitting a control signal to instruct the actuator(s) 68 and/or the fluid source 64 to lower the platform 58.

[0031] Still in another example, the controller 74 may receive user input indicative of generating the show effect. For example, an operator may indicate to the controller 74 via an input device (e.g., display, knob, button) of the controller 74 to generate the show effect. In response to receiving the indication, the controller 74 may transmit the control signal to the one or more actuator(s) 68 and/or the fluid source 64 to adjust the configuration of the platform 58. In this way, the show effect may be generated and provide an immersive experience for the guest(s) 54.

[0032] FIG. 2 is a schematic diagram of an embodiment of the attraction system 50 including the show effect system 56. In particular, FIG. 2 illustrates the show effect system 56 including the platform 58 coupled to a hinge 66 (e.g., of the one or more hinge(s) 66), three inflatables 62, and a sensor 70. In an embodiment, the show effect system 56 may include any suitable number of hinge(s) 66, inflatable(s) 62, and/or sensor(s) 70 coupled to the platform 58 for generating the show effect.

[0033] When in a partially submerged configuration (also referred to as the submerged configuration or the first configuration) of the platform 58 in the liquid reservoir 55, the platform 58 may be positioned such that a first portion 100A may be submerged and a second portion 100B may not be submerged. To this end, a first side 102A of the platform 58 (e.g., within the first portion 100A) may be coupled to the three inflatables 62 and a second side 102B of the platform 58 (e.g., within the second portion 100B) may be coupled to the hinge 66. The first side 102A and the second side 102B may be opposite sides of the platform 58. The first side 102A may be positioned below the second side 102B in a vertical direction 106 in the partially submerged

configuration of the platform 58. For example, an angle 104 between the hinge 66 and the platform 58 may be less than ninety degrees. The second side 102B may be supported by the hinge 66, which may be positioned higher in the vertical direction 106 in comparison to the first side 102A as supported by the three inflatables 62 in the partially submerged configuration of the platform 58. For example, each of the three inflatables 62 may be deflated or partially deflated, thereby causing the first side 102A to lie within the liquid reservoir 55 (hidden from the guest's perspective). Correspondingly, the second side 102B may not be covered by the liquid and may be visible with respect to the guest's perspective.

[0034] Although the platform 58 may be partially submerged, the one or more guest(s) 54 may walk on the platform 58 and interact with the one or more object(s) 60. That is, the second portion 100B may be visible to the guest(s) 54 and may allow for guest interactions. For example, the second portion 100B may include one or more object(s) 60, such as foliage (e.g., trees, bushes, flowers, grass), geological characteristics (e.g., rocks, soil, sand), biological characteristics, and the like for guest interactions. In another example, the one or more object(s) 60 may include a pathway for the guest(s) 54 to traverse, which may lead to the first portion 100A. When covered by the liquid, the first portion 100A may appear to the guest(s) 54 as beyond a shoreline and the liquid may appear to move like a wave that ebbs and flows. In certain instances, the transition from the second portion 100B to the first portion 100A may visually appear as a shallow shoreline. The first portion 100A may also include a set of the one or more object(s) 60, which may be different from the set of the object(s) 60 disposed on the second portion 100B. For example, the one or more object(s) 60 within the first portion 100A may include shells, seaweed, pebbles, rocks, a treasure chest, and the like. The guest(s) 54 may interact with the object(s) 60 by walking into the liquid.

[0035] During guest interactions, the sensor 70 may generate and transmit sensor data of the one or more guest(s) 54. For example, the sensor 70 may monitor movement of the guest(s) 54 within the second portion 100B. In another example, the sensor 70 may generate sensor data of a number of guest(s) 54 within the second portion 100B. The controller 74 may receive the sensor data and analyze the sensor data for an indication to cause generation of the show effect. Additionally or alternatively, the controller 74 may receive user input indicative of generating the show effects.

[0036] In response to guest interaction and/or user input, the controller 74 may instruct the show effect system 56 to transition from a first configuration (e.g., submerged configuration) to a second configuration (e.g., exposed configuration). For example, the controller 74 may instruct the fluid source 64 to provide fluid to the inflatables to adjust a configuration of the platform 58 based on a target pressure level of the inflatables 62. For example, the second configuration may be associated with a target pressure level of 100 PSI. That is, inflating the inflatables 62 to 100 PSI may cause the inflatables 62 to raise the first portion 100A in the vertical direction 106 and expose the first portion 100A to the guest's perspective. As such, the platform 58 may be in an exposed configuration or a second configuration.

[0037] The controller 74 may instruct the fluid source 64 to provide fluid to the inflatables 62 over a period of time to adjust the configuration of the platform 58. The period of time may be 30 seconds, 1 minute, 2 minutes, 5 minutes, 10 minutes, 30 minutes, and so on. In certain instances, it may be desirable to adjust the position of the platform 58 over a long period of time to decrease detection of the movement by the guest(s) 54 during the show effect. For example, adjusting an angle 104 between the hinge 66 and the platform 58 by twenty degrees over one minute may cause less perception of the movement by the guest(s) 54 in comparison to adjusting the angle by twenty degrees over ten seconds. As such, the guest(s) 54 may not perceive (e.g., feel) the transition of the platform 58 from the first configuration to the second configuration.

[0038] In an embodiment, the platform 58 may be coupled to an actuator 68 that may assist the inflatables 62 in adjusting the configuration of the platform 58. For example, a first actuator 68 may be coupled to a first side of the platform 58 adjacent to the hinge 66 and the inflatables 62 and a second actuator 68 may be coupled to a second side of the platform 58 opposite to the first side. The controller 74 may instruct the first actuator 68 and/or the second actuator 68 to adjust the configuration of the platform 58 based on a target angle value. The controller 74 may store a target angle value in the memory 76 corresponding to the first configuration and a target angle value corresponding to the second configuration. The controller 74 may instruct the actuator 68 to adjust the angle 104 to the target angle value corresponding to the second configuration. The target angle value may be greater than or equal to ninety degrees. In certain instances, the actuator 68 may increase the angle 104 by thirty degrees or

more. To this end, the actuator 68 may move the platform 58 upwards in the vertical direction 106 to adjust the angle 104, which may cause both the first portion 100A and the second portion 100B to be visible to the guest's perspective.

[0039] FIG. 3 is an overhead view of an embodiment of the attraction system 50 including the show effect system 56. In particular, FIG. 3 illustrates a transition from a first configuration 120A (e.g., submerged configuration) to a second configuration 120B (e.g., exposed configuration) by an arrow 122. By way of example, the platform 58 may be 60 feet by 40 feet. The first side 102, 102A and the second side 102, 102B may each be 60 feet long, which may create the visual appearance of a shoreline that may be 60 feet long. The one or more hinge(s) 66 may be coupled to a first side of the platform 58 and the one or more inflatable(s) 62 may be coupled to a second side of the platform 58 that may be opposite the first side. Moreover, the one or more actuator(s) 68 may be coupled to a third side and/or a fourth side of the platform 58 that may be adjacent to the first side and the second side. For example, a set of inflatable(s) 62 may be coupled every ten feet along the first side 102, 102A (the side furthest from the guest 54 in the illustrated embodiment) for a total of six sets of inflatable(s) 62 within the show effect system 56. Further, a hinge 66 may be coupled every five feet along the second side 102, 102B for a total of twelve hinges 66. Further, a first actuator 68, 68A may be coupled along a third side 102, 102C and a second actuator 68, 68B may be coupled along a fourth side 102, 102D. However, any suitable number of inflatable(s) 62, hinge(s) 66, and/or actuator(s) 68 may be coupled to the platform 58. The width of the first portion 100A and the second portion 100B may each be 20 feet long. In the first configuration, the first portion 100A may be immersed within the liquid reservoir 55 and the second portion 100B may be visible from the guest's perspective. That is, half of the platform 58 may be covered by the liquid.

[0040] In the illustrated embodiment, the one or more guest(s) 54 may enter the show effect system 56 from the guest area 52 and stand within the second portion 100B. The second portion 100B may include one or more object(s) 60 to disguise a transition to the show effect system 56, such as from the guest area. The transition to the show effect system 56 may be enhanced by the object(s) 60, which may include foliage, signs, benches, or the like to create an illusion of entering a geographic area including a body of water, such as a lagoon or pond. Additionally, the transition between the first portion

100A and the second portion 100B of the platform 58 may create an illusion of a shallow shoreline. That is, the angle 140 between the platform 58 and the actuator 68 may angle the first portion 100A within the liquid reservoir 55 such that areas of the first portion 100A may remain visible from the guest's perspective. That is, the liquid may ebb and flow over the first portion 100A. Additionally, the liquid reservoir 55 may be a size and/or hold an amount of liquid to visually appear without an ending from the guest's perspective. This appearance may also be facilitated by backdrop with appropriate background imagery. In this way, the show effect system 56 may simulate a shoreline of a body of water.

[0041] To provide the show effect, the controller 74 may transmit a control signal to the fluid source 64 and/or the actuators 68. For example, the controller 74 may transmit a control signal to the fluid source 64 to instruct the fluid source 64 to provide a fluid to the inflatables 62. As such, the inflatables 62 may be inflated and adjust the position of the platform 58. Concurrently, the hinges 66 may extend to push the platform 58 in the vertical direction, which may cause the first portion 100A to be exposed to the guest's perspective. Additionally or alternatively, the controller 74 may transmit a control signal to the actuator 68 to instruct the actuator 68 to extend, thereby causing the platform 58 to transition from the first configuration 120A to the second configuration 120B. For example, the actuator 68 may adjust the configuration of the platform 58 in the vertical direction 106 to cause both the first portion 100A and the second portion 100B (or more of the second portion 100B) to be visible from the guest's perspective. As illustrated, the liquid may recede to expose the first portion 100A and the guest(s) 54 may view and/or interact with the one or more object(s) 60 within the first portion 100A. The object(s) 60 may include geological characteristics, such as sand, soil, rocks, and biological characteristics, such as sea animals. The guest(s) 54 may move to the first portion 100A and interact with the one or more object(s) 60. The second configuration 120B may visually appear as low tide from the guest's perspective.

[0042] After a period of time, the controller 74 may transmit a control to the fluid source 64 and/or the actuator 72 to transition the platform 58 from the exposed configuration to the submerged configuration. For example, the controller 74 may transmit the control signal to the fluid source 64 to instruct the fluid source 64 to remove

fluid from the inflatables 62. Deflating the inflatables 62 may cause the first portion 100A to sink and/or become submerged in the liquid. In addition, the hinge 66 may retract (e.g., bend) to lower the first portion 100 into the liquid. Additionally or alternatively, the controller 74 may transmit a control signal to the actuators 68 to instruct the actuators 68 to lower the platform 58 into the liquid. As such, the platform 58 may be in the submerged configuration and prepare for a subsequent show effect generation.

[0043] FIG. 4 is an overhead view of an embodiment of the attraction system 50 including the show effect system 56. In particular, FIG. 4 illustrates a transition (indicated by the arrow 122) from the first configuration 120A to the second configuration 120B. In an embodiment, the one or more object(s) 60 may include a pathway leading from a first area within the attraction system 50 to a second area within the attraction system 50. For example, the pathway may span across a length or a width of the platform 58 and allow the guest 54 to access the liquid reservoir 55 and traverse across the platform 58. The guest(s) 54 may access the pathway via a reservoir entry, such as a guest portal, a doorway, an arch, or the like. In addition, the reservoir entry may be decorated with one or more object(s) (such as the one or more object(s) 60 described with respect to FIG. 1) to provide an indication to the guest(s) 54. A portion of the pathway may be hidden in the first configuration 120A and the pathway may be visible in the second configuration 120B. As such, in the second configuration 120B, the guest 54 may traverse across the pathway and into the liquid reservoir 55.

[0044] For example, the guest(s) 54 may participate in a treasure hunt within the attraction system 50 and/or the amusement park. The guest(s) 54 may reach the show effect system 56 and perform a movement (e.g., gesture, action, activity) to reveal a hidden pathway leading to a final destination of the treasure hunt. The show effect system 56 may be in the first configuration 120A when the guest(s) 54 arrive. That is, the first portion 100A may be submerged within the liquid reservoir 55, thereby hiding a portion of the pathway from the guest's perspective. The second portion 100B may also include a portion of the pathway, which may lead the guest(s) 54 to the first portion 100A. A sensor 70 of the show effect system 56 may monitor a movement of the guest(s) 54 to determine if the show effect may be generated.

[0045] If the guest(s) 54 performs the movement (e.g., a gesture, series of gestures, arrives at a specific location, performs a particular activity) or otherwise supplies some form of input (e.g., input provided via a device, remote control, button, user interface, tracked element), the controller 74 may trigger generation of the show effect. For example, the controller 74 may transmit a control signal to the fluid source to instruct the fluid source to provide fluid to inflate the inflatables to adjust the configuration of the platform 58. Additionally or alternatively, the controller 74 may transmit a control signal to the actuators to adjust the configuration of the platform 58 from the first configuration 120A to the second configuration 120B. As such, the first portion 100A may be elevated above the liquid to reveal the hidden pathway for the guest(s) 54 to traverse and complete the quest. The first portion 100A may be adjacent the reservoir entry to allow the guest(s) 54 to traverse across the pathway. In this way, the show effect system 56 may create an immersive and/or interactive experience for the guest(s) 54.

[0046] FIG. 5 is a flowchart of a method or process 150 for providing a show effect within the attraction system. Any suitable device (e.g., the processing circuitry 78 of the controller 74 illustrated in FIGS. 1-4 in coordination with other system components) may perform the respective method steps. In an embodiment, each method step may be implemented based on executing instructions stored in a tangible, non-transitory, computer-readable medium (e.g., the memory 76 of the controller 74 illustrated in FIGS. 1-4). For example, each method step may be performed at least in part by one or more software component(s), one or more software application(s), and the like. While the method is described using operations in a specific sequence, additional operations may be performed, the described operations may be performed in different sequences than the sequence illustrated, and/or certain described operations may be skipped or not performed altogether.

[0047] In block 152, the controller 74 may receive an indication to raise the platform 58. For example, the controller 74 may receive user input that triggers generating the show effect (e.g., detection of a gesture that meets thresholds for a required activation gesture). The show effect may include raising the platform 58 to expose the one or more object(s) 60. An operator of the show effect system 56 may provide the user input via a button, a knob, a display, a user interface and the like. For example, an operator

may monitor behavior of the guest(s) 54 as they participate in an entertainment venue such as an “escape room” and activate the show effect via an input based on their actions. In another example, the controller 74 may receive sensor data from the sensor 70 and analyze the sensor data to determine a movement of the guest(s) 54 and/or a number of the guest(s) 54 being supported by the platform 58. If the controller 74 determines that the movement of the guest(s) 54 matches a movement template stored in the memory 76, then the controller 74 may transmit a control signal to the fluid source 64 to provide fluid to the inflatables 62 and/or the actuator 68 to extend, thereby causing the platform 58 to be raised out of the liquid. If the controller 74 determines that the movement of the guest(s) 54 does not match a movement template stored in the memory 76, then the controller 74 may continue to collect sensor data. In another example, the controller 74 may receive the sensor data and analyze the sensor data to determine if a number of guest(s) 54 is greater than a threshold number. The guest(s) 54 may queue at the show effect system 56 and if the number of guest(s) 54 reaches the threshold number, then the show effect may be triggered. By controlling the platform 58 to allow access to a ride or other venue through a liquid reservoir based on a number of guests in a staging area, the platform 58 may effectively operate as a queue control mechanism that facilitates group boarding/entry or the like.

[0048] In block 154, the controller 74 may instruct an actuator 68 to raise the platform 58 and/or a fluid source 64 to provide fluid. The controller 74 may transmit a control signal to the actuator 68 to instruct the actuator 68 to raise the platform 58, thereby exposing the platform 58 to the guest’s perspective. Additionally or alternatively, the controller 74 may transmit a control signal to the fluid source 64 to instruct the fluid source 64 to provide fluid to the inflatables 62, thereby inflating the inflatables 62. The inflatables 62 may push the platform 58 from the liquid reservoir 55, thereby exposing the platform 58 to the guest’s perspective. To this end, the control signal may be indicative of adjusting a configuration of the platform 58 from the first configuration 120A to the second configuration 120B. The first configuration 120A may be an initial state such that the first portion 100A may be submerged in the liquid reservoir 55 and the second portion 100B may be exposed or visible to the guest(s) 54. The second configuration may be an exposed configuration such that the object(s) 60 coupled to the platform 58 may be visible to the guest(s) 54. That is, both the first portion 100A and the second portion 100B (at least a portion thereof) may not be

submerged in the liquid reservoir 55. Some small segment of the second portion 100B may continually remain submerged in the liquid reservoir 55.

[0049] In block 156, the controller 74 may receive an additional indication for lowering the platform 58. For example, the controller 74 may receive an additional indication from the operator via an input of the show effect system 56, such as a knob, a display, and the like. The additional indication may instruct the controller 74 to lower the platform 58 into the liquid reservoir 55. In another example, the controller 74 may determine a lapse of a period of time and transmit the control signal in response to the lapse. That is, the indication for lowering the platform 58 may be passage of a certain amount of time (which may be flexible or fixed). In such an embodiment, the platform 58 may remain in the first configuration 120A for a first period of time and transition to the second configuration 120B for a second period of time. The first period of time may be less than, equal to, or greater than the second period of time. In yet another example, the controller 74 may analyze the sensor data to determine the number of guest(s) 54 in comparison to a threshold number, and this comparison may trigger the additional indication.

[0050] In block 158, in response to the additional indication, the controller 74 may instruct the actuator 68 to lower the platform 58 and/or a fluid source 64 to remove fluid. For example, the controller 74 may transmit a control signal to the actuator 68 instructing the actuator 68 to transition the platform 58 from the second configuration 120B to the first configuration 120A. Additionally or alternatively, the controller 74 may transmit the control signal to the fluid source 64 to instruct the fluid source 64 to deflate the inflatables 62. For example, the fluid source 64 may remove fluid from the inflatables 62, thereby causing the configuration of the platform 58 to be adjusted. That is, deflating or partially deflating the inflatables 62 may lower the first side 102, 102A into the liquid. As such, the show effect system 56 may reset to the first configuration 120A.

[0051] It should be noted that the process 150 may be continually or repeatedly performed. For example, the controller 74 may continually monitor a movement of the guest(s) 54 and/or a number of guest(s) 54 supported by the platform 58 and instruct the actuator 68 to adjust a position and/or an orientation of the platform 58 and/or the fluid source 64 to provide and/or remove fluid from the inflatables 62. As such, the

platform 58 may alternate between the first configuration and the second configuration, thereby generating the show effects for the guest(s) 54.

[0052] While only certain features of the invention have been illustrated and described herein, many modifications and changes will occur to those skilled in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the invention.

[0053] The techniques presented and claimed herein are referenced and applied to material objects and concrete examples of a practical nature that demonstrably improve the present technical field and, as such, are not abstract, intangible or purely theoretical. Further, if any claims appended to the end of this specification contain one or more elements designated as “means for (perform)ing (a function)...” or “step for (perform)ing (a function)...”, it is intended that such elements are to be interpreted under 35 U.S.C. 112(f). However, for any claims containing elements designated in any other manner, it is intended that such elements are not to be interpreted under 35 U.S.C. 112(f).

CLAIMS

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

a platform positioned within a reservoir and configured transition between configurations to control submersion and extraction of at least a portion of the platform with respect to a liquid disposed within the reservoir;

a reservoir entry that provides guest access to the reservoir, wherein a first side of the platform is adjacent the reservoir entry;

a fluid source coupled to one or more inflatables and configured to control fluid flow into and out of the one or more inflatables, wherein the one or more inflatables are coupled to a second side of the platform opposite the first side;

one or more hinges coupling the first side of the platform to a structure of the reservoir; and

a controller communicatively coupled to the fluid source and configured to instruct the fluid source to inject fluid into or extract the fluid from the one or more inflatables to lift or lower the second side and rotate the platform about the one or more hinges such that the platform transitions from a first configuration with a first level of platform submersion in the liquid to a second configuration with a second level of platform submersion in the liquid, wherein the first level of submersion is different than the second level of submersion.

2. The show effect system of claim 1, wherein the transition from the first level of submersion to the second level of submersion exposes a first portion of the platform and is perceived by a guest as the liquid receding.

3. The show effect system of claim 1, wherein the controller is configured to:

in response to a first input, instruct the fluid source to inject the fluid into the one or more inflatables to achieve the first configuration; and

in response to a second input, instruct the fluid source to remove the fluid from the one or more inflatables to achieve the second configuration.

4. The show effect system of claim 1, wherein the fluid source comprises:
one or more first pumps configured inject the fluid into the one or more inflatables and one or more second pumps configured to extract the fluid from the one or more inflatables; and/or
one or more reversible pumps configured to inject the fluid into the one or more inflatables in a first mode of operation and extract the fluid from the one more inflatables in a second mode of operation.
5. The show effect system of claim 1, comprising a sensor communicatively coupled to the controller, wherein the sensor is configured to provide sensor data corresponding to one or more guests interacting with the show effect system.
6. The show effect system of claim 5, wherein the controller is configured to analyze the sensor data to determine that movement of a first guest of the one or more guests matches at least one of a plurality of movement templates stored in a database.
7. The show effect system of claim 5, wherein the sensor data is indicative of a number of guests positioned on a surface of the platform and the controller is configured to control the show effect system based on comparing the sensor data to a threshold.
8. The show effect system of claim 1, comprising at least one actuator coupled to the platform and the structure of the reservoir, wherein the controller is communicatively coupled to the at least one actuator and configured to instruct the at least one actuator to actuate to adjust the platform.
9. The show effect system of claim 1, wherein the transition between the first configuration to the second configuration occurs at a rate that is is sufficiently slow to have limited human perception. .
10. A show effect system of an amusement park, the show effect system comprising:
a platform positioned within a reservoir and configured transition between configurations to control submersion and extraction of at least a portion of the platform with respect to a liquid disposed within the reservoir;

a first side of the platform coupled to a structure of the reservoir via one or more hinges;

a second side of the platform opposite the first side;

an actuation system coupled to the second side of the platform; and

a controller communicatively coupled to the actuation system and configured to instruct the actuation system to lift or lower the second side such that the platform is rotated about the one or more hinges such that the platform transitions from a first configuration with a first level of platform submersion in the liquid to a second configuration with a second level of platform submersion in the liquid, wherein the first level of submersion is different than the second level of submersion.

11. The show effect system of claim 10, comprising a reservoir entry adjacent to the first side of the platform, wherein the reservoir entry comprises a guest portal and wherein the first side of the platform extends to or through the guest portal to facilitate guest transition onto the platform.

12. The show effect system of claim 10, wherein the actuation system comprises a fluid source and one or more inflatables configured to be filled and emptied by the fluid source.

13. The show effect system of claim 12, wherein the fluid source comprises one or more pumps and the one or more inflatables comprises air-tight bags.

14. The show effect system of claim 10, wherein the actuation system comprises a hydraulic actuator or a mechanical lift.

15. An attraction system for an attraction, the attraction system comprising:
a platform coupled to one or more objects and positioned within a reservoir,
wherein:

in a first configuration, a first portion of the platform is positioned within liquid disposed in the reservoir and not directly visible to a guest and a second portion of the platform is extracted from the liquid and directly visible to the guest; and

in a second configuration, at least some of the first portion of the platform is exposed from the liquid along with the second portion of the platform;

a sensor configured to transmit sensor data indicative of information corresponding to the guest;

at least one actuator coupled to the platform and configured to adjust a position of the platform between the first configuration and the second configuration; and

a controller coupled to the sensor and the at least one actuator, wherein the controller is configured to:

instruct the at least one actuator to adjust the position of the platform based on the sensor data.

16. The attraction system of claim 15, wherein the at least one actuator comprises a fluid source coupled to at least one inflatable and configured to inflate and deflate the at least one inflatable.

17. The attraction system of claim 15, wherein the controller is configured to:
after a period of time in the first configuration or the second configuration,
instruct the at least one actuator to transition to the other configuration.

18. The attraction system of claim 15, wherein the controller is configured to:
determine a movement of the guest corresponds to a stored movement template in a database based on the sensor data; and
instruct the actuator to adjust the position of the platform based on the determination.

19. The attraction system of claim 15, wherein the controller is configured to:
receive sensor data indicative of a number of guests positioned on a surface of the platform;
determine the sensor data exceeds a threshold; and
instruct the at least one actuator to adjust the position of the platform based on the sensor data exceeding the threshold.

20. The attraction system of claim 15, comprising at least one hinge coupling the platform and configured to support a weight of the platform.