

CLAIMS:

1. An amusement park attraction mapping system, comprising:
 - a sensing system configured to be disposed within an environment of an amusement park attraction, the sensing system configured to capture scanning data of the environment, wherein the scanning data comprises virtual points representative of objects in the environment;
 - a positioning system coupled to the sensing system, wherein the positioning system is configured to move the sensing system within the environment; and
 - a controller communicatively coupled to the sensing system and the positioning system, wherein the controller is configured to:
 - determine target scanning data to be captured by the sensing system;
 - output a first control signal to instruct the positioning system to move the sensing system to a target position based on the target scanning data; and
 - output a second control signal to instruct the sensing system to capture the scanning data at the target position.
2. The amusement park attraction mapping system of claim 1, wherein the controller is configured to:
 - determine whether sufficient scanning data has been captured;
 - determine, in response to a determination that sufficient scanning data has not been collected, additional target scanning data to be captured by the sensing system based on the scanning data;
 - output a third control signal to instruct the positioning system to move the sensing system to an additional target position based on the additional target scanning data; and
 - output a fourth control signal to instruct the sensing system to capture additional scanning data at the additional target position.

3. The amusement park attraction mapping system of claim 2, wherein the controller is configured to determine whether sufficient scanning data has been captured based on an amount of the scanning data, a resolution of the scanning data, a number of sets of the scanning data, or any combination thereof.

4. The amusement park attraction mapping system of claim 2, wherein the scanning data is associated with a first area of the environment, and the additional scanning data is associated with a second area of the environment separate from the first area.

5. The amusement park attraction mapping system of claim 2, wherein the scanning data and the additional scanning data each comprises a set of shared virtual points, and the controller is configured to combine the scanning data and the additional scanning data together based on the set of shared virtual points.

6. The amusement park attraction mapping system of claim 1, wherein the positioning system comprises at least two positioning arms coupled together via at least one joint, wherein the controller is configured to actuate each positioning arm to move the sensing system.

7. The amusement park attraction mapping system of claim 1, wherein the positioning system is coupled to a ride vehicle of the amusement park attraction, the first control signal is configured to instruct the positioning system to move the sensing system to the target position relative to the ride vehicle, the controller is configured to output a third control signal to instruct the ride vehicle to move to a target location within the environment such that the sensing system is moved to the target location, and the second control signal is configured to instruct the sensing system to capture the scanning data at the target position and at the target location.

8. The amusement park attraction mapping system of claim 1, wherein the sensing system comprises a light detection and ranging device, an infrared three-dimensional (3D) scanner, a structured light scanner, a digital photogrammetry scanner, or any combination thereof.

9. A controller for a scanning and mapping system of an amusement park, the controller comprising a tangible, non-transitory, computer-readable medium having computer-executable instructions stored thereon that, when executed, are configured to cause one or more processors to:

determine target scanning data of an environment of the amusement park to be captured, wherein the target scanning data comprises a target collection of virtual points;

output a first control signal to a ride vehicle of the amusement park to move a sensing system to a target location within the amusement park based on the target scanning data;

output a second control signal to a positioning system coupled to the ride vehicle to move the sensing system to a target position relative to the ride vehicle based on the target scanning data; and

output a third control signal to the sensing system to capture scanning data at the target location and the target position.

10. The controller of claim 9, wherein the instructions, when executed, are configured to cause the one or more processors to output the first control signal to instruct the ride vehicle to move along a path of an attraction of the amusement park within the environment.

11. The controller of claim 9, wherein the instructions, when executed, are configured to cause the one or more processors to output the second control signal to

instruct the positioning system to rotate the sensing system relative to the ride vehicle, translate the sensing system relative to the ride vehicle, or both.

12. The controller of claim 9, wherein the instructions, when executed, are configured to cause the one or more processors to receive a user input and to determine the target scanning data based on the user input.

13. The controller of claim 9, wherein the instructions, when executed, are configured to cause the one or more processors to receive previously-captured scanning data of the environment and to determine the target scanning data based on the previously-captured scanning data.

14. A theme park attraction system, comprising:
a ride vehicle;
a sensing system configured to capture scanning data of an environment of a theme park attraction, wherein the scanning data comprises data points representative of physical objects in the environment;
a positioning system coupling the sensing system to the ride vehicle, wherein the positioning system is configured to move the sensing system relative to the ride vehicle; and
a controller communicatively coupled to the ride vehicle, the sensing system, and the positioning system, wherein the controller is configured to:
determine sets of target scanning data to be captured by the sensing system;
instruct the ride vehicle and the positioning system to move the sensing system to a plurality of placements within the environment, wherein each placement is associated with a set of target scanning data of the sets of target scanning data;

instruct the sensing system to capture sets of scanning data, wherein each set of scanning data of the sets of scanning data is associated with a respective placement of the plurality of placements; and

combine the sets of scanning data with one another to create a data point cloud of the environment.

15. The theme park attraction system of claim 14, wherein the controller is configured to instruct the ride vehicle to move to a location within the environment and instruct the positioning system to move the sensing system to a position relative to the ride vehicle based on the location.

16. The theme park attraction system of claim 14, wherein the sensing system comprises a location sensor, and the controller is configured to:

receive respective sensor feedback from the location sensor to determine a respective location of the sensing system within the environment for each set of scanning data of the sets of scanning data;

associate each set of scanning data of the sets of scanning data with the respective location of the sensing system within the environment; and

combine the sets of scanning data together based on the respective locations associated with each set of scanning data of the sets of scanning data.

17. The theme park attraction system of claim 14, wherein the controller is configured to:

compare the data point cloud of the environment with a baseline layout of the environment;

determine a discrepancy between the data point cloud of the environment and the baseline layout of the environment; and

output a signal related to an adjustment of a feature of the environment in response the discrepancy.

18. The theme park attraction system of claim 17, wherein the controller is configured to output the signal to send a notification to a user indicative of the adjustment of the feature, to adjust the feature automatically, or both.

19. The theme park attraction system of claim 17, wherein the baseline layout comprises a pre-existing map of the environment, a model of the environment, or both.

20. The theme park attraction system of claim 19, wherein the controller is configured to:

compare the data point cloud of the environment with the baseline layout of the environment;

determine whether a discrepancy exists between the pre-existing map of the environment and the baseline layout; and

output a signal to verify placement or appearance of features of the environment in response to non-existence of the discrepancy.