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Patent Public Search | Text View

United States Patent Application Publication

20250265862

Kind Code

A1

Publication Date

August 21, 2025

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GUEST MEASUREMENT SYSTEMS AND METHODS

Abstract

A guest measurement system includes a controller configured to receive image data indicative of guest characteristics. The controller includes a processor configured to identify one or more anatomical features of the guest and the reference marker in the image data and scale distances between the identified anatomical features in the image data from a virtual space of the image data to a real-world space using the reference marker in the image data. Based on the scaled distances, the system can generate a guest height calculation.

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Family ID: 1000008577964

Appl. No.: 19/201350

Filed: May 07, 2025

Related U.S. Application Data

parent US continuation 17835741 20220608 parent-grant-document US 12300014 child US 19201350

Publication Classification

Int. Cl.: G06V40/10 (20220101); A63G31/00 (20060101); G06T3/40 (20240101); G06T7/60 (20170101); G06T7/73 (20170101); G06V10/74 (20220101)

U.S. Cl.:

Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS [0001] This application is a continuation of U.S. patent application Ser. No. 17/835,741, entitled “GUEST MEASUREMENT SYSTEMS AND METHODS,” filed Jun. 8, 2022, which is hereby incorporated by reference in its entirety for all purposes.

BACKGROUND

[0002] The present disclosure relates generally to the field of amusement parks. More specifically, embodiments of the present disclosure relate to methods and equipment utilized to measure guests in an amusement park to assess one or more physical characteristics and/or determine eligibility to enter an attraction of the amusement park, e.g., enter an amusement ride as a passenger.

[0003] Theme or amusement parks have become increasingly popular. More sophisticated and creative ride attractions have been helpful in increasing the popularity and success of such parks. Certain attractions may be height-restricted to passengers that are above a height threshold. For example, theme park ride attractions may involve ride vehicles, such as roller coaster type cars, or other vehicles that move along a ride path. Height restrictions for a ride may involve restricting the ride to passengers within a particular height range that can be fitted to the restraints of each seat. The passengers can be measured before entering the ride to determine if they fit within the height restrictions. For example, a passenger can manually compare their height to a line on the wall.

SUMMARY

[0004] Certain embodiments commensurate in scope with the originally claimed subject matter are summarized below. These embodiments are not intended to limit the scope of the disclosure, but rather these embodiments are intended only to provide a brief summary of certain disclosed embodiments. Indeed, the present disclosure may encompass a variety of forms that may be similar to or different from the embodiments set forth below.

[0005] In accordance with one embodiment, a guest measurement system is provided that includes one or more cameras configured to generate image data indicative of guest characteristics in an attraction measurement area of an individual attraction within an amusement park, wherein the image data comprises an image of a reference marker in the attraction measurement area. The guest measurement system also includes a controller configured to receive the image data indicative of the guest characteristics from the one or more cameras. The controller includes a processor that is configured to identify one or more anatomical features of the guest in the image data; identify the reference marker in the image data; scale distances between the identified anatomical features in the image data from a virtual space of the image data to a real-world space using the reference marker in the image data; and generate a guest height calculation based on the scaled distances between the identified anatomical features.

[0006] In accordance with an embodiment, method of measuring a guest in an attraction measurement area is provided that includes receiving image data indicative of guest characteristics from one or more cameras; identifying one or more anatomical features of the guest in the image data; identifying a reference marker in the image data; scaling distances between the identified anatomical features in the image data from a virtual space of the image data to a real-world space using the reference marker in the image data; and generating a guest height calculation based on the scaled distances between the identified anatomical features.

[0007] In accordance with one embodiment, a guest measurement device is provided that includes

one or more cameras configured to generate sensor signals comprising image data indicative of guest characteristics in an attraction measurement area of an individual attraction within an amusement park. The guest measurement device also includes a controller configured to receive the sensor signals indicative of the guest characteristics from the one or more cameras. The controller includes a processor that is configured to identify one or more anatomical features of the guest in the image data; identify a reference marker in the image data; scale distances between the identified anatomical features in the image data from a virtual space of the image data to a real-world space using the reference marker in the image data; and generate a guest height calculation based on the scaled distances between the identified anatomical features. The guest measurement device also includes a display configured to display an indication of the guest height calculation.

Description

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 view of a guest measurement system in operation in an amusement park in accordance with present embodiments;

[0010] FIG. 2 is a flow diagram of a method using a guest measurement system in accordance with present embodiments;

[0011] FIG. 3 is an example user interface of a guest measurement system in accordance with present embodiments;

[0012] FIG. 4 is an example user interface of a guest measurement system in accordance with present embodiments;

[0013] FIG. 5 is an example user interface of a guest measurement system in accordance with present embodiments;

[0014] FIG. 6 is a schematic illustration of measurements from virtual space of a guest measurement system that are mapped into real space in accordance with present embodiments;

[0015] FIG. 7 is a block diagram of a guest measurement system in accordance with present embodiments; and

[0016] FIG. 8 is a schematic view of an attraction measurement area of the amusement park utilizing the guest measurement system in accordance with present embodiments.

DETAILED DESCRIPTION

[0017] Presently disclosed embodiments facilitate attraction measurement techniques for measuring one or more guest characteristics that in turn may be used to determine eligibility of the guest to enter a height-restricted attraction. The measurement techniques permit guests to be measured while in a variety of positions, e.g., standing, seated, slouching, or leaning over. Further, the measurement techniques reduce user measurement error or confusion associated with attraction eligibility requirements.

[0018] FIG. 1 shows an example guest measurement system 12 that includes a controller 14 coupled to one or more cameras 16 that generate image data in a guest measurement area 20 of an attraction. The image data, in turn, is used to generate guest measurements by mapping the virtual world image data into real-world space such that relative virtual distances between anatomical features in the image data are used to estimate guest measurements.

[0019] The one or more cameras 16 that capture the image data are coupled to or housed in a guest measurement device 24. The guest measurement device 24 is a portable, hand-held device containing the one or more cameras 16 in order to obtain measurements by moving the hand-held

device in front of the guest to obtain relevant data. In one embodiment, the guest measurement device **24** containing the one or more cameras **16** is hand-held mobile device or tablet. In an embodiment, the guest measurement device **24** may be coupled to a kiosk or fixed-position housing.

[0020] The one or more cameras **16** may also obtain image data that includes a reference marker **32** disposed along an axis of a plane in the measurement area **20** and that is used to map the virtual space into the real world. In the illustrated example, the reference marker is disposed on a wall or post **34** that is positioned at an appropriate location within the measurement area **20** such that the guest is appropriately positioned to intersect a plane of the reference marker **32**. The guest measurement system **12** may include a position marker **38** to correctly position the guest relative to the reference marker **32**. Where the guest measurement device **24** is portable or at least partially adjustable, the guest measurement device **24** can be oriented or repositioned to capture both the guest and the reference marker **32** within a field of view of the camera **16**.

[0021] The reference marker **32** may be a QR code, an image (e.g., a 2D image), a printed or formed shape, or other image-resolvable feature of fixed size or dimensions. Based on a relationship between features of the reference marker **32** in the image data and known real-world measurements of the feature of the reference marker **32**, anatomical features of the guests can be mapped to real-world space from the virtual space.

[0022] The one or more cameras **16** collect image data that includes image data representative of one or more guests, illustrated as a first guest **22a** and a second guest **22b** in FIG. **1**. The image data is provided to a controller **14**, which uses the image data to determine a guest characteristic, such as height. The guest measurement system **12** permits guests to be accurately measured while leaning over or seated, e.g., in a wheelchair or a stroller. As shown by way of example, the first guest **22a** is taller than the second guest **22b**. However, the first guest **22a** is leaning over, while the second guest **22b** is holding a balloon. If a distance **30** from the ground represents the minimum height to ride an attraction, an optical beam type sensor that measures beam disruptions at the minimum height would mistakenly indicate the second guest **22b** as being tall enough, because the balloon would break the beam. Further, the first guest **22a** would also be incorrectly identified as being not tall enough. In contrast, the disclosed measurement system **12** as provided herein would correctly identify the first guest **22a** as being tall enough and the second guest **22b** as not being at least the minimum height. The system **12** uses sensor signals to identify anatomical features and generate a height calculation based on estimated dimensions or distances between of the anatomical features. In embodiments, the system **12** may provide a display or other indicator to indicate qualifying or not qualifying height calculations.

[0023] In an embodiment, using the information obtained via the one or more cameras **16**, one or more guest features are identified. With the foregoing in mind, FIG. **2** is a flow diagram of a method **100** using a guest measurement system in accordance with present techniques. The method **100** includes receiving (block **102**) image data indicative of guest characteristics from one or more cameras **16** disposed in a measurement area **20**. In an embodiment, the measurement area **20** can be at an amusement park entrance, at a guest services center, or at an individual attraction. In an embodiment, a guest measurement event can take place once, and the system **12** stores the determined guest measurements and provides the guest measurements to be validated for different attractions. Thus, the guest **22** can be measured only once for a variety of attractions.

[0024] The method **100** includes detecting (block **104**) anatomical features, e.g., one or based on the image data. It may be appreciated that the image data may first be filtered, normalized, calibrated, and/or pre-processed to be used more readily with a height calculation logic as provided herein. A presence and a position of various limbs and/or anatomical features of the guest, including the guest's head, neck, torso, pelvis, thigh, knee, calf, shin, ankle, foot, toe, hand, wrist, finger, elbow, forearm, and so forth may be identified or detected based on the image data. The image data also includes the reference marker **32**, and the method **100** also identifies the reference

marker **32** within the image. The reference marker **32** can be selected to be quickly and easily identified and distinguished from other real-world features captured in the image data. In an embodiment, the reference marker **32** may be imaged in the visible spectrum and/or may be imaged outside of the visible spectrum. Thus, the image data may include data from a visible light camera (e.g., an RGB camera) and a fluorescent or infrared camera.

[0025] The distances between two or more different identified anatomical features are scaled (block **106**) from a virtual space to a real-world space using the reference marker **32** as generally discussed herein. In an embodiment, the techniques may be used to identify a limb difference, such as an amputation and the length of identified amputation. Based on stored attraction information, a notification can be generated for one or more attractions of attractions within an amusement park that the guest is eligible to ride.

[0026] The method **100** includes generating a guest height calculation (block **108**) based on the scaled distances. The estimated dimensions may include a length estimate between joints (e.g., wrist-to-elbow; elbow-to-shoulder, ankle-to-knee, knee-to-hip) and/or a width estimate in a plane parallel to a length axis. By using the method described herein, the guest may be measured to determine whether he can enter the ride without having to stand up from a wheelchair, assisted mobility device, stroller, and so forth. Further, it may be appreciated that the techniques described herein may also be applied to a guest that does not have any movement restrictions.

[0027] The guest features may be an anatomical feature, e.g., each of the guest's limbs are identified. The guest's head, neck, torso, pelvis, arms, knees, shins, ankles, feet, hands, toes, fingers, and so forth may be identified. It may be appreciated that some of these limbs may have a paired limb or corresponding limb across a medial axis of the guest's body (i.e., a right limb and a left limb). The presently disclosed embodiments include identifying virtual space distances between identified anatomical features and scaling these measurements to the real world. The total height of the guest may be estimated or calculated using stored relationships between height and these distances. In an embodiment, scaled distances between a top of shoulder and a top of head, a top of shoulder to waist, and/or a waist to floor or foot can be used to determine guest height. The presently disclosed embodiments include generating an overall height calculation of the guest based on the identified distances in image data (e.g., virtual space) that are scaled to real-world space using features of the reference marker **32** as a scaling factor. In this way, the guest may remain seated (e.g., in a wheelchair) while being measured prior to accessing the ride.

[0028] FIG. **3** is an example user interface **130** of the guest measurement system **12** showing a camera feed **132** displayed via the user interface **130**. The user interface **130** may include a box or other marker **136** overlaid on the camera feed **132** indicating an appropriate position of the reference marker **32**. In an embodiment, an operator can open a guest measurement application operating on a hand-held device to activate the cameras. The cameras capture a real-time camera feed **132** that is displayed. In an embodiment, the user interface **130** also includes a clickable key **138**. In an embodiment, the clickable key **138** defaults to an inactive state but is activated only when the reference marker **32** is appropriately positioned to trigger display of the clickable key **138** or to trigger activation of the clickable key **138** on the user interface **130**. The user interface **130** may, in embodiments, additionally or alternatively include an overlaid marker to guide guest positioning at an appropriate location in the camera feed **132** relative to the reference marker **32**. When the operator determines that the guest is appropriately positioned, the operator can provide a user input via the clickable key to capture image data, e.g., a still image, used for the guest height calculation as discussed herein. In embodiments, any overlaid markers on the user interface **130** are not included in the captured still image.

[0029] FIG. **4** shows the captured still image **138** used for the guest height calculation displayed on the user interface **130**. Accordingly, the user interface **130** of FIG. **3** may transition to the user interface **130** of FIG. **4** during operation. After the image data is captured, the system **12** uses the image data of the captured still image **139** to generate one or more anatomical feature markers **140**

that are overlaid on the captured still image **138**. The anatomical feature markers are generated based on anatomical feature recognition performed on the image data. For example, the system **12** may use a trained neural network to identify one or more of a head, eyes, mouth, nose, eyebrows, shoulders, limbs, waist, hands, feet, etc. The guest measurement area **20** may be maintained with white or plain surroundings so that the captured still image **138** is free of other features that may generate false positives. Thus, the captured still image **138** can, in embodiments, only include the reference marker **32** and the guest **22** as object in the image, which can render anatomical feature recognition more computationally efficient.

[0030] In an embodiment, the system **12** completes an initial anatomical feature recognition using the captured still image. In the illustrated embodiment, the user interface **130** includes three different anatomical feature markers **140**: a top of head marker **140a**, a shoulder marker **140b**, and a waist marker **140c**. The anatomical feature markers **140** are overlaid on the captured still image **138** at locations that correspond to the respective identified anatomical features. In the illustrated embodiment, the anatomical feature markers **140** are text-labeled lines that intersect or pass through their corresponding identified anatomical features. However, it should be understood that other graphical indicators, shapes, or configurations are also contemplated. For example, the identified anatomical features may be marked with highlighting, shading, boxes, etc.

[0031] To account for variability in guest clothing, hats, hairstyles, and posture, the system **12** may permit operator input to confirm that the anatomical feature markers **140** are correctly positioned before proceeding with the guest height calculation based on these identified anatomical features. In the illustrated example, anatomical feature markers **140** appear to generally correspond with the correct locations, and the user can click or activate the confirm key **142**. However, if one or more of the anatomical feature markers **140** are incorrectly located, the user can click the edit key **144** to manually change the location or locations of the anatomical feature markers **140**.

[0032] FIG. **5** shown an example user interface of the system **12** in which the top of head marker **140a** is incorrectly positioned at the top of the guest hat rather than at a location that generally corresponds with the top of the guest's head. The operator can click the edit key **144** to permit manual repositioning of the top of head marker **140a**. The repositioning can be responsive to various guest inputs, such as via dragging, arrow down, hand or gaze gestures, or voice commands. Once the anatomical feature markers **140** are all correctly positioned, the operator can select the confirm key **142** to instruct the system **12** to proceed with guest height calculation.

[0033] In an embodiment, the method **100** may include machine learning features using a training set of validated measurements. In one example, the training set may generate validated measurements use a height measurement from an alternative method. The alternative measured height for a particular individual can be used to train the system to adjust the marker positioning on an image of the individual until the generated height calculation, using the markers, would output the correct height that matches the height from the alternative method. In an embodiment, the machine learning model can be used to train the feature identifier to more accurately identify the anatomical features and/or position the markers in the image. Further, the machine learning model can include an assist feature to help an operator reposition the markers **140**. That is, the machine learning model can be used to identify if an operator is providing accurate input to reposition the marker and generate a displayed indicator that the marker positioning may be inaccurate or may trigger a check before submission.

[0034] FIG. **6** is a schematic illustration of measured virtual space distances that can be scaled as provided herein. For example, using the confirmed anatomical features (or, in embodiments, portions of the overlaid markers **140**), image distances **150**, **152** can be determined between these identified features. Further, image dimensions of the reference marker **32** can be determined. In the illustrated example, the reference marker **32** has a generally rectangular shape and includes a height dimension **154** and a width dimension **156**. Because the reference marker **32** is a real-world object with fixed real-world dimensions, the real-world dimensions can be used as a scaling factor to

generate real-world values corresponding to the distances **150**, **152** between the identified anatomical features. In an embodiment, the virtual space may be arbitrary or relative units. For example, the distances **150**, **152** may be determined to be relative values based on the virtual dimensions **154**, **156**. In one example, the shoulder-waist distance **152** may be determined to be a 3× multiple of the height dimension **154**. Thus, the scaling factor used is 3 to determine the real-world distance between the shoulder and waist of the guest.

[0035] While the illustrated example shows head, should, and waist anatomical features, more or fewer anatomical features may be identified. To determine a final total height calculation based on real-world scaled distances between these identified anatomical features, an anatomical model may be used. Thus, the guest height may be a function of a typical range of heights for individuals having the same shoulder to waist, shoulder to head, and waist to head distances as measured. Further, the system **12** may incorporate feedback and machine learning to improve guest measurement calculations.

[0036] FIG. 7 is a block diagram of a guest measurement system **200** (e.g., the guest measurement system **12**) in accordance with present embodiments. The guest measurement system **200** includes a controller **202** that may be implemented in a computing device, a server, a distributed processor, or a cloud-computing environment. The controller **202** includes a processor **204** and a memory **206**. The processor **204** may include one or more processing devices (processing or computing circuitry), and the memory **206** may include one or more tangible, non-transitory, machine-readable media. By way of example, such machine-readable media can include RAM, ROM, EPROM, EEPROM, or optical disk storage, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to carry or store desired program code in the form of machine-executable instructions or data structures and which can be accessed by the processor **204** or by other processor-based devices (e.g., mobile devices). The controller **202** may utilize one or more types of software-based instructions executable by the processor **204**. For example, the instructions may include accessing stored information, such as real-world features of the reference marker **32**. Association techniques may be used to find relationship between variables. In one embodiment, the system **200** can use a relationship between one or more features of the reference marker **32** in the image data to identify a correct scaling factor to scale distances in the image data to real-world space.

[0037] The system **200** may receive various inputs **210** in order to generate a guest height indication and perform other actions based on estimated guest height. For example, the system **200** may receive ride information **212**, including height restrictions for a particular ride. The ride information **212** may include a number of available seats, a number of seats that can accommodate guests in an assisted mobility vehicle, restrictions about which types of assisted mobility vehicles are suitable for the particular ride, height restrictions, and weight restrictions, among others. For example, the ride may have particular height or weight limitations. Additionally, certain ride seats may only accommodate a certain depth for a passenger, and thus, a guest with certain disability equipment (e.g., a cane, a wheelchair, etc.) may not be able to go on the ride, may require the use of an additional seat (e.g., adjacent seats), or may require a particular seat on the ride that is suitable for the guest.

[0038] The system **200** receives image data from one or more cameras **214**. The one or more cameras **214** may include visible light cameras or cameras that detect non-visible light. The one or more cameras **214** may include an infrared camera and a RGB camera in order to obtain a guest's measurements.

[0039] The system **200** may use various mathematical equations and relationships (e.g., geometry, a 3D Pythagorean theorem, linear interpolation) between virtual space and real-world space in order to scale between virtual space and real-world space. In order to determine the guest height, the controller **202** may perform a calibration to scale to a measurement obtained by the one or more cameras **214** using measured dimensions of the reference marker. The controller **202**

determines the height calculation **218** for measured guest using the scaling. The controller **202** may output the overall height calculation to determine whether the ride has sufficient space to accommodate the guest while the guest remains seated or assisted by the guest's assistive equipment (e.g., in the guest's wheelchair, assisted mobility device, stroller) without requiring the guest to disembark from the guest's assistive equipment. In an embodiment, the output may include a notification regarding eligibility to ride a particular attraction based on the estimated height.

[0040] The controller **202** may be communicatively coupled to a display **219** that can display the height calculation **218**. In an embodiment, the controller **202** can receive user inputs **220**, e.g., via capacitive sensors integrated into the display **219**. The estimated height for the guest may be output to the display **219** in order to let the park employee know whether the guest **22** can be accommodated on the ride.

[0041] In certain embodiments, the disclosed guest measurement system **200** may use facial recognition or other guest tracking techniques to correlate a guest to a measured height. Thus, the guest may be measured at an earlier point in the day, and the estimated height logged to the guest profile. Using guest recognition techniques, the recognized guest can be associated with their estimated height using the guest profile at other attractions to determine ride eligibility. In this manner, the measurement need only occur once during the day.

[0042] FIG. **8** is a schematic of a side view of an attraction measurement area of the theme park utilizing the guest measurement system **200** of FIG. **7** in accordance with present embodiments. In the illustrated embodiment, the guest **22** is able to be measured in the attraction measurement area **224** that can be adjacent to the ride area **226** or can be part of a guest services space so that the guest is measured one time, e.g., as part of entrance processing. The attraction measurement area may include one or more cameras **232** within the attraction measurement area **220**. The one or more sensors **232** can be moved via a motor **234** that is communicatively coupled to a controller **202** in order to adequately capture the image data. Additionally or alternatively, the one or more sensors **232** can be disposed in a hand-held device **236** (e.g., a wand, a tablet, or a mobile device). The hand-held device **236** may be used by a park employee **238** to capture the image data when the hand-held device **236** is positioned in front of the guest **22**.

[0043] It may be appreciated that the guest **22** may be asked to move into a space **240** so that the guest **22** may be measured. The space **240** may include a reference marker **244**. The space **240** may be an area where the space **240** can be readily viewed via the one or more camera **232** of the hand-held device **236** held by the park employee. The reference marker **244** may be a particular marker or a prop with image resolvable features that is in the plane of the space **240**. The reference marker **244** may be disposed substantially parallel to the guest measurement space **240**. When the guest **22** is determined to be in position, the height measurement can be initiated. In certain embodiments, the capturing of the reference marker initiates guest height measurement or. That is, the cameras **232** pick up the reference marker to activate guest measurement features of the system **200**.

[0044] In embodiments, the sensors **232** are housed in the hand-held device **236**, which may be a mobile device or tablet, and an operator activates the sensors **232** via interaction with a user interface of the mobile device or tablet. In an embodiment, the features of the controller **200** are also housed within the hand-held device **236**. In other embodiments, the hand-held device **236** communicates wirelessly with the system **200**, and the image data is communicated to a remote or separate system processor **204** that performs the guest height calculations based on the communicated image data. In other embodiments, the guest measurement may be performed using separate fixed-location cameras or cameras positioned within a kiosk location in the guest measurement area **220**.

[0045] It may be appreciated that the guest measurement system **200** may be used to measure the guests **22** that are in a wheelchair, an assisted mobility device, a stroller, a cart, and so forth, or any time the guest **22** is holding an accessory **248** (e.g., a cane, a shopping bag, a purse) that may partially obstruct the view of the guest **22**. In the illustrated embodiment, the guest measurement

system **200** may be used to measure the guest **22** in a wheelchair. When the guest **22** is in a wheelchair or a stroller, it may be appreciated that a portion of the guest's body may be obstructed from view of the one or more cameras **232**. For example, a view of the guest's left leg may be obstructed by a component of the wheelchair. In this instance, the one or more cameras **232** may be unable to adequately capture the dimensions of the guest's left leg. However, as discussed herein, the operator **238** may provide locations of the anatomical features via user input to permit the guest height calculation to proceed when feature information used in the calculation is missing or unresolvable in the image data.

[0046] In embodiments, depending on the configuration of the ride **252**, the system **200** may receive updates from the ride **252** as seating configurations change or as the ride **252** is loaded. Thus, the system **200** can also determine if the guest height calculation is compatible with a particular ride **252** in its current configuration or load state. For example, if the ride **252** includes three seats for passengers below a particular height range, the system **200** can track if any of these seats are available when a guest in the permitted height range presents for measurement.

[0047] While only certain features of the present embodiments 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 present disclosure. Further, it should be understood that certain elements of the disclosed embodiments may be combined or exchanged with one another.

[0048] 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 method of measuring a guest in an attraction measurement area comprising: receiving first image data indicative of a first set of guest characteristics from one or more cameras; training a machine learning model to identify anatomical features using the first image data; receiving second image data indicative of a second set of guest characteristics and a reference marker from one or more cameras; applying the machine learning model to the second image data to identify the anatomical features of a guest in the second image data; scaling one or more distances between the anatomical features in the second image data from a virtual space of the second image data to a real-world space using the reference marker in the second image data; and generating a guest height calculation based on the one or more distances between the anatomical features.
2. The method of claim 1, wherein the machine learning model comprises a neural network.
3. The method of claim 1, wherein an output of applying the machine learning model comprises identifying a head, eyes, mouth, nose, eyebrows, shoulders, limbs, waist, hands, feet, or any combination thereof.
4. The method of claim 1, further comprising accessing real-world measurements of the reference marker and using the real-world measurements and features of the reference marker in the second image data to generate a scaling function.
5. The method of claim 4, wherein scaling the distances comprises using the scaling function.
6. The method of claim 1, further comprising displaying the guest height calculation.
7. The method of claim 1, further comprising determining an eligibility of the guest for an attraction of an amusement park based on the guest height calculation.

- 8.** A guest measurement device, comprising: one or more cameras configured to generate sensor signals comprising image data indicative of guest characteristics in an attraction measurement area; and a controller configured to receive the sensor signals indicative of the guest characteristics from the one or more cameras, the controller comprising a processor configured to: identify anatomical features of a guest and a reference marker in the image data; generate one or more estimated positions of the anatomical features; receive input from a user adjusting the one or more estimated positions of the anatomical features; generate one or more updated positions of the anatomical features based on the input; scale one or more distances between the one or more updated positions of the anatomical features in the image data from a virtual space of the image data to a real-world space using the reference marker in the image data; and generate a guest height calculation based on the one or more distances between the one or more updated positions of the anatomical features.
- 9.** The guest measurement device of claim 8, wherein the anatomical features comprise a top of head position of the guest.
- 10.** The guest measurement device of claim 9, wherein the one or more updated positions comprise an adjusted top of head position that is lower or higher than an estimated top of head position based on the input.
- 11.** The guest measurement device of claim 8, wherein the input is received via a graphical user interface.
- 12.** The guest measurement device of claim 8, wherein the input comprises repositioning via dragging, arrow down, hand or gaze gestures, voice commands, or any combination thereof.
- 13.** A guest measurement system, comprising: one or more cameras configured to generate image data in an attraction measurement area, wherein the image data comprises an image of a reference marker in the attraction measurement area; and a controller configured to receive the image data from the one or more cameras, the controller comprising a processor configured to: identify anatomical features of a guest in the image data; identify the reference marker in the image data; receive input from a user adjusting one or more positions of the anatomical features; finalize positions of the identified anatomical features based on the input; scale one or more distances between the finalized position of the identified anatomical features in the image data from a virtual space of the image data to a real-world space using the reference marker in the image data; and generate a guest height calculation based on the scaled one or more distances.
- 14.** The guest measurement system of claim 13, wherein the one or more cameras are coupled to a portable user device.
- 15.** The guest measurement system of claim 14, wherein the portable user device is a tablet or mobile device.
- 16.** The guest measurement system of claim 13, wherein the anatomical features of the guest comprise a head, a shoulder, and a hip.
- 17.** The guest measurement system of claim 13, wherein the processor is configured to: identify a floor or ground in the image data; and use a location of the floor or ground to determine the guest height calculation.
- 18.** The guest measurement system of claim 13, wherein the processor is configured to: access real-world measurements of the reference marker; and use a relationship between features of the reference marker in the image data and the real-world measurements of the reference marker to generate a scaling function; and scale the one or more distances using the scaling function.
- 19.** The guest measurement system of claim 18, wherein the real-world measurements represent a planar section of the reference marker, wherein the planar section corresponds to a plane of the image data.
- 20.** The guest measurement system of claim 13, wherein the reference marker is a QR code.
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