SPECIFICATION

TITLE OF INVENTION : DISPLAY CONTROL APPARATUS, DISPLAY CONTROL METHOD, AND DISPLAY CONTROL PROGRAM

Technical Field

[0001]

The present disclosure is related to a display control apparatus, a display control method, and a display control program for displaying information related to a swing of a golf club.

Background Art

[0002]

Conventionally, there are various apparatuses that capture images of a golfer during a swing to date. By providing the golfer with the recorded image of the swing, it becomes possible to promote the improvement of golf swing and enables the proper fitting of a golf club which is suited to the golfer.

[0003]

For example, Patent Document 1 proposes to determine the quality of a swing by capturing images of a golfer's swing. In addition, Patent Documents 2 through 4 propose to display the clubhead path.

[Background Art Documents]

[Patent Documents]

[0004]

[Patent Document 1]

Japanese Patent No. 6544551

[Patent Document 2]

Japanese Unexamined Patent Publication No. 2015-077351

[Patent Document 3]

Japanese Unexamined Patent Publication No. 2015-198761

[Patent Document 4]

Japanese Unexamined Patent Publication No. 2017-144130

Summary

[0005]

It is very important to be aware if a clubhead path in order to analyze a swing of a golf club.

[0006]

As described above, Patent Document 1 discloses determining the quality of a swing of a golf club. However, Patent Document 1 does not disclose displaying a clubhead path.

[0007]

In addition, Patent Documents 2 and 3 disclose calculating and displaying the clubhead path based on signals detected by sensors provided in the vicinities of grips of golf clubs.

[0008]

However, the methods disclosed in Patent Documents 2 and 3 have a problem in the accuracy of calculating the position of the clubheads, because the sensors are provided in the vicinities of the grips. That is, since the clubhead path is affected by movement in the vicinity of a grip, it is not always possible to calculate the clubhead path with high accuracy.

[0009]

Further, calculating the position of the center of gravity of a clubhead and obtaining the clubhead path thereof by discriminating images of the clubhead, for example, may be considered.

[0010]

However, in the case that images of a golf club swing are captured from a predetermined direction, for example, the images of the clubhead included in the captured images change in shape every moment along with the swing, and include images in which the position of the center of gravity of the clubhead cannot be calculated. Therefore, it is difficult to accurately calculate the position of the clubhead from such images, and such a method lacks stability.

[0011]

In view of the foregoing problems, the present disclosure provides a display control apparatus, a display control method, and a display control program capable of displaying accurate and stable information regarding a clubhead path.

[0012]

In a first aspect, the present disclosure provides a display control apparatus, comprising: a captured image acquiring unit that acquires a plurality of captured images of a swing of a golf club; a specific position detecting unit that detects the position of a neck of the golf club included in each of the captured image; a trajectory information generating unit that generates trajectory information of the position of the neck by linking positions of the neck which are detected in each of the captured images in order that the plurality of captured images

are captured; and a display control unit that displays the trajectory information of the position of the neck.

In a second aspect, the present disclosure provides a display control method, comprising: acquiring a plurality of captured images of a swing of a golf club, detects the position of a neck of the golf club which is included in each of the captured images; generating trajectory information of the position of the neck by linking positions of the neck which are detected in each of the captured images in the order that the plurality of captured images are captured; and displaying the trajectory information of the position of the neck.

In a third aspect, the present disclosure provides a display control program that causes a computer to execute the steps of: acquiring a plurality of captured images of a swing of a golf club; detecting the position of a neck of the golf club which is included in each of the captured images; generating trajectory information of the position of the neck by linking positions of the neck which are detected in each of the captured images in the order that the plurality of captured images are captured; and displaying the trajectory information of the position of the neck,

[0013]

According to the display control apparatus of the present disclosure, the position of the neck of the golf club is detected from a plurality of captured images of the swing of the golf club, information regarding the movement trajectory of the position of the neck is generated based on the detected positions of the neck, and the information regarding the movement trajectory of the position of the neck is displayed. Therefore, it is possible to display accurate and stable information regarding a clubhead path.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Fig. 1 is diagram that illustrates the schematic configuration of a golf impact analysis system that employs an embodiment of the display control apparatus of the present disclosure.

Fig. 2 is a collection of diagrams that illustrate the position of a neck of a golf club in each captured image of a swing of the golf club.

Fig. 3 is a diagram that illustrates an example of display of information regarding a trajectory of the position of the neck of the golf club.

Fig. 4 is a collection of diagrams that illustrate an example of an animation display of the information regarding the trajectory of the position of the neck of the golf club.

Fig. 5 is a collection of diagrams that illustrate the position of the golf club neck and the position of a grip in each captured image of the swing of the golf club.

Embodiments of the Disclosure

[0015]

A golf swing analysis system that employs an embodiment of the display control apparatus of the present disclosure will be described in detail below with reference to the attached drawings. Fig. 1 is diagram that schematically illustrates the configuration of a golf swing analysis system 1 of the present embodiment.

[0016]

The golf swing analysis system 1 of the present embodiment is equipped with an image capturing device 10, a display control apparatus 20, and a display device 30, as illustrated in Fig. 1. The image capturing device 10 and the display control apparatus 20, and the display control apparatus 20 and the display device 30 are communicably connected via wired or wireless connections, and are configured such that various signals