understanding of the characteristics of the golfer's swing, but also the selection of a golf club which is matched to such characteristics.

[0006]

However, it is difficult to detect the position of the clubhead and the clubface with high precision from captured images only by capturing a moving clubhead from above as proposed in Patent Document 1.

[0007]

In addition, Patent Document 2 proposes a method in which a fiducial marking/markings for measuring movement of a clubhead is adhered to the clubhead, as well as the clubface of the clubhead, etc. is used for detection of the marking, thus, detecting of clubhead and the club face movement with high precision.

[0008]

However, the method described in Patent Document 2 adhesive attachment of the fiducial mark(s) for measuring movement of a clubhead. Therefore, in the case that the movement of clubfaces is detected for a variety of golf clubs, it is necessary for marks for measuring movement of clubheads to be adhesively attached to each of the golf clubs, which is troublesome.

[0009]

The present disclosure has been developed in view of the foregoing circumstances. The present disclosure provides a method, an apparatus, and a program that facilitate confirmation of information related to a golf club swing.

[Solution to the Problem]

[0010]

In a first aspect, ~~T~~the present disclosure provides a display control apparatus ~~of the present disclosure is equipped with~~comprising: a captured image obtaining unit that obtains multiple captured images of a clubhead of a golf club during a swing of the golf club in temporal series from above; a specified position detecting unit that detects positional data of each of a toe and a heel of the clubhead which are included in the multiple captured images, by inputting the multiple captured images obtained by the captured image obtaining unit into a learned model obtained by machine learning of relationships between ~~a plurality of (or~~ multiple~~)~~ ~~captured~~ arbitrary images of clubheads of golf clubs captured from above and positional data of toes and heels of the clubheads which are included in the ~~plurality of~~ multiple captured images; and a control unit that displays information based on the positional data of the toe and the heel of the clubhead detected by the specified position detecting unit as points within the multiple captured images, and sequentially displays the multiple captured images having the points

displayed therein.

[0011]

In a second aspect, ~~T~~the present disclosure provides a display control method ~~of the present disclosure~~comprising obtain~~ings~~ multiple captured images of a clubhead of a golf club during a swing of the golf club in temporal series from above; detect~~ings~~ positional data of each of a toe and a heel of the clubhead which

are included in the multiple captured images, by inputting the multiple captured images into a learned model obtained by machine learning of relationships between multiple ~~captured~~ arbitrary images of clubheads of golf clubs captured from above and positional data of toes and heels of the clubheads which are included in the multiple captured images; and displaying~~s~~ information based on the positional data of the toe and the heel of the clubhead as points within the multiple of captured images, and sequentially displaying the multiple of captured images having the points displayed therein.

[0012]

In a third aspect, ~~T~~the present disclosure provides a non-transitory computer-readable recording medium having stored therein a display control program ~~of the present disclosure~~ causing~~s~~ a computer to execute: a step obtaining multiple captured images of a clubhead of a golf club during a swing of the golf club in temporal series from above; a step detecting positional data of each of a toe and a heel of the clubhead which are included in the multiple captured images, by inputting the multiple captured images into a learned model obtained by machine learning of relationships between multiple ~~captured~~ arbitrary images of clubheads of golf clubs captured from above and positional data of toes and heels of the clubheads which are included in the multiple captured images; and a step displaying information based on the positional data of the toe and the heel of the clubhead as points within the multiple captured images, and sequentially displaying the multiple captured images having the points displayed therein.

[Effects]

[0013]

According to the display control apparatus, the display control method, and the display control program of the present disclosure, positional data of the toe and the heel of the clubhead which are included in the captured images are detected, by inputting the captured images into a learned model, and information is displayed based on the detected positional data of the toe and the heel of the clubhead. Therefore, confirmation of information related to a golf club swing is facilitated.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

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

FIG. 2 is a diagram that illustrates an example of a captured image in which

positional data of a toe and a heel of a clubhead, as well as a neck and an edge at the position of the shaft of a golf club are detected .

FIG. 3 is a diagram that illustrates an example of a projected display of a group of line segments that represent a clubface and a club path image, which are generated by a single golf club swing.

FIG. 4 is a diagram that illustrates an example of a projected display of a group