The Application of Motion Capture Device in Improving Surgical Skills

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Abstract: The capture device proposes a doctor's surgical science wisdom supervision system, comprising: at least one VR lens disposed in the operating room for capturing a panoramic video of the operation. At least one motion capture device for monitoring motion information of at least one location server, configured to receive the action information of the panoramic video and the at least one portion. The server is further configured to reconstruct the three-dimensional surgical image of the surgical panoramic video by using VR technology. The server is also used for real-time monitoring action to capture the body condition information and the environment information of the object. According to the motion information of at least one part, the body condition information and the environment information, the complete motion posture and the complete motion information of the motion capture object are obtained. The intelligent supervision system actively serves medicine, abandons empty slogan education and cold theoretical preaching, runs through the "ideological and political gene elements" and integrates diversified ideological and political elements into the whole process before, during and after the doctor's operation. Let science and technology serve doctors and benefit the people.

Introduction

Surgery in hospitals, especially major operations, requires full video recording so that other doctors outside the operating room can see the progress of the operation at any time [1]. These video data can also be used as learning materials for older doctors to guide young doctors [2].

In the prior art, cameras are usually arranged at all angles of the operating room for full-range video recording [3]. However, in the actual operating room, because the operation space is relatively small, plus the doctor's hands and surgical instruments to occlude the vision. Therefore, these methods can only record the general progress of the operation, and the operation details of many operations are still not observed in the video [4-6].

VR lens photography of surgical procedure

A doctor's surgical action intelligent supervision system is characterized in that it comprises: at least one VR lens disposed in the operating room for taking a panoramic video of the operation [7]. At least one motion capture device for monitoring motion information of at least one location. a server, configured to receive the action information of the panoramic video and the at least one portion [8]. The server is further configured to reconstruct the three-dimensional surgical image of the surgical panoramic video by using VR technology. The server is further configured to monitor physical condition information and environmental information of the motion capture object in real time [9]. And obtaining, according to the action information of the at least one part, the physical condition information, and the environment information, a complete motion posture and complete motion information of the motion capture object [10-12]. The system also includes an RFID reader for identifying the RFID radio frequency tag disposed on the surgical tool.

1. A medical surgical science wisdom monitoring system according to claim 1 [13]. The method includes: performing, according to the action information of the at least one part, the physical condition information, and the environment information, a complete motion posture and complete

motion information of the motion capture object, specifically:

Processing the motion information, the body condition information and the environment information of the one or more parts to obtain position information, acceleration, angular velocity and geomagnetic information of the motion capture object [14]. And generates a biomechanics model according to the position information, acceleration, angular velocity and geomagnetic information, and obtains complete motion posture and complete motion information of the motion capture object according to the biomechanics model [15].

2. The doctor's operation science popularization wisdom supervision system according to claim 1, characterized in that the server also updates the medical teaching scene according to the data acquired by the motion capture device [16].

3. The medical surgical wisdom monitoring system according to claim 1, wherein the system further comprises a display device for playing the three-dimensional surgical image [17].

4. The doctor's surgical science wisdom supervision system according to claim 4, wherein the display device is a VR head-mounted eye shield [18].

Popular Science Intelligence Supervision System

In view of the above-mentioned shortcomings of the prior art, the purpose of the capture device is to provide a doctor's operation popular science intelligence monitoring system to solve the problem that the prior art cannot capture the operation details [19].

In order to achieve the above and other related purposes, the capture device provides a doctor's operation science popularization wisdom supervision system, including:

At least one VR lens arranged in the operating room is used for photographing the full-motion video of the operation.

At least one motion capture device for monitoring motion information of at least one part.

A server, configured to receive the action information of the panoramic video and the at least one portion.

The server is further configured to reconstruct the three-dimensional surgical image of the surgical panoramic video by using VR technology.

The server is further configured to monitor physical condition information and environmental information of the motion capture object in real time. And obtaining, according to the action information of the at least one part, the physical condition information, and the environment information, a complete motion posture and complete motion information of the motion capture object.

The system also comprises an RFID reader-writer used for identifying the RFID radio frequency tag arranged on the surgical tool.

Optionally, the obtaining of the complete motion posture and complete motion information of the motion capture object according to the motion information of the at least one part, the body condition information and the environment information specifically includes:

Processing the motion information, the body condition information and the environment information of the one or more parts to obtain position information, acceleration, angular velocity and geomagnetic information of the motion capture object [20]. And generating a biomechanical model according to the position information, the acceleration, the angular velocity, and the geomagnetic information, and obtaining a complete motion posture and complete motion information of the motion capture object according to the biomechanical model.

Optionally, the server further updates the medical teaching scene according to the data acquired by the motion capture device.

Optionally, the system further includes a display device for playing the three-dimensional surgical image.

Optionally, the display device is a VR head-mounted eyepatch.

As mentioned above, a doctor operation popular science wisdom supervision system of the capture instrument has the following beneficial effects:

According to the capture instrument, a VR lens is arranged in an operating room, and a server

reconstructs a full-motion video shot by the VR lens into a three-dimensional surgical image. VR lens can not only capture the whole operation process and the operation details, but also restore the real three-dimensional operation scene for doctors, making them experience the feeling of being personally present, which is beneficial to later teaching. At the same time, the doctor can use the motion capture device to watch the subtle indicators of various actions during the operation, and help the doctor to improve the surgical skills and scientific research.

Specifically, the VR headset includes an first spectacle lens, a second ophthalmic lens, and an adjustment module for adjusting a separation distance between the first ophthalmic lens and the second ophthalmic lens.

The adjustment module adjusts the distance between the first ophthalmic lens and the second ophthalmic lens by:

The eye image information of the user is acquired by an image acquisition device.

According to the eye image information, the distance between the two pupils of the user is calculated.

Acquiring interpupillary distance information of the user according to the distance between two pupils of the user.

According to the eye information, if it is determined that the eye information does not meet the visual condition of the VR head-mounted eyepatch, then an adjustment mode is determined according to the eye information, including:

If it is determined that the interpupillary distance information does not meet the interpupillary distance configuration information in the visual condition, the adjustment mode is determined to be the interpupillary distance adjustment mode according to the interpupillary distance information and the interpupillary distance configuration information.

The capture device reconstructs a panoramic video captured by the VR lens into a surgical three-dimensional surgical image by setting a VR lens in the operating room. The VR lens can not only capture the whole process of the operation and the operation details therein, but also the three-dimensional surgical image can restore the real three-dimensional operation scene to the doctor, so that it can experience the immersive feeling and facilitate the later teaching. When in use, the doctor can observe the VR video and compare the corresponding contramotion with the VR video through the data of the motion capture device. Watch the subtle indicators of various movements during the operation to help doctors improve their operation skills and scientific research for the benefit of patients. Let science and technology and art serve the people! Better Realization of " Cure Diseases"!

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