Improvement of Medical Clinical Teaching by VR Medical Surgical Helmet

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Abstract: Utilizing a VR medical surgery science teaching helmet, including a camera for real-time image acquisition; a transmission device for transmitting the real-time captured image to a processing module; and a processing module for splicing the real-time captured image Forming a complete panoramic picture; the processing module performs real-time encoding on the complete panoramic picture to generate a panoramic preview video; and a VR helmet body for viewing the panoramic video. By using a VR medical surgical science teaching helmet, the whole process of doctor's operation can be stereoscopically photographed. Students can observe the whole process of doctor's operation through the helmet, instead of the traditional teaching demonstration mode of text and PPT, so that the video can be more intuitive. In the new media environment, the use of new technologies to enable medical students to develop the socialist core values education in the "all-round full-scale" education long-term education mechanism, the two focus points, to enhance the pertinence and effectiveness of education. Cultivate high-quality medical talents with both ability and political integrity!

1. Background Technology

As a special profession, doctors need professional medical skills, and the mastery of these skills requires a continuous learning process. In the past two years, surgical teaching system has become an important township project for clinical teaching, academic exchanges or remote guidance. The video recorded by the surgery is also a valuable learning material, and it is an important evidence for a medical accident in the future. However, the existing surgical teaching system does not make students immersive and not intuitive enough.

2. Specific Implementation Methods

The following describes the implementation of the VR medical teaching helmet by a specific specific example. Those skilled in the art can easily understand other advantages and effects of the VR medical teaching helmet from the contents disclosed in the present specification. The VR medical teaching helmet can also be implemented or applied by different specific embodiments, and the details in the present specification can also be based on different viewpoints and applications. Various modifications or changes are made without departing from the spirit of VR medical teaching helmet. It should be noted that the following embodiments and the features in the embodiments can be combined with each other without conflict.

VR medical teaching helmet provides a VR medical operation popular science teaching helmet, which comprises:

Camera for real-time image acquisition;

The transmission device is used to transmit the real-time collected picture to the processing module.

The processing module is used for splicing the real-time collected pictures into a complete panoramic picture.

The processing module performs real-time encoding on the complete panoramic picture to

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generate a panoramic preview video;

A VR helmet body for viewing the panoramic video;

The processing module constructs a virtual training scenario according to the panoramic video;

The processing module is also used to record the strength of the operator's hand and the explanation of the operator's corresponding operation process.

The processing module includes a basic data storage unit, a virtual model of all medical devices used in the operation process, and corresponding device function information.

The practitioner uses the corresponding medical device model to complete the training in the virtual training scene according to the explanation of the operation process and the hand strength. In particular, during the surgical training of the practitioner, the strength of the surgical instrument model is also displayed, and the strength is compared with the recorded strength, and the practitioner adjusts according to the displayed strength and the strength of the recording to make the display The strength is close to the strength of the record.

Optionally, the hand force is acquired by a surgical instrument with force feedback.

The camera includes a regular polyhedral support, and an image sensor is disposed on each face of the regular polyhedral support.

In an embodiment, the image sensor is disposed at a center of each face of the regular polyhedral bracket.

In an embodiment, the image sensors have the same field of view and the angle of view of each image sensor is greater than the angle between two adjacent image sensor axes.

In one embodiment, the optical axis of the image sensor on each face of the regular polyhedron coincides with the line connecting the face of the image sensor to the center of the regular polyhedron.

In an embodiment, the panoramic camera splices the captured images into a complete panoramic picture in real time, including:

Get multiple images for mosaic panoramic images.

The multi-images are expanded into longitude and latitude images respectively.

Extracting the splicing regions between the plurality of latitude and longitude images respectively, obtaining a plurality of splicing regions, and projecting the plurality of splicing regions onto the unit ball;

Extracting the cylinder area corresponding to the area to be spliced on the unit sphere, and respectively calculating the optical flow field between the left and right images of the area to be spliced;

According to the optical flow field between the left and right images of the stitching area, the images of each stitching area are fused separately until the images of all stitching areas are fused, and the panoramic images after seamless stitching are obtained.

The method expands a plurality of images into longitude and latitude images respectively, including:

Obtaining a model that expands the captured image to the latitude and longitude image;

According to the model, the plurality of images are respectively expanded to obtain a plurality of latitude and longitude images respectively corresponding to the plurality of images.

In one embodiment, the VR helmet body includes a first ophthalmic 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 lens and the second lens by the following ways:

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.

Obtaining the distance information of the user according to the distance between the two pupils of the user;

According to the eye information, if it is determined that the eye information does not satisfy the visual condition of the VR glasses, determining an adjustment mode according to the eye information includes:

And determining, according to the distance information and the distance configuration information, that the adjustment mode is a distance adjustment mode.

According to the adjustment mode, the VR glasses are adjusted, including:

According to the pupil distance information of the user, the position of the first and second glasses of the VR glasses is adjusted.

According to the pupil distance information of the user, the pupil distance of the user and the current pupil distance of the VR glasses are compared.

Controlling the first motor and the second motor to drive the first lens corresponding to the first motor and the second corresponding to the second motor, if the user's lay length is greater than the current distance of the VR glasses The ophthalmic lens is synchronously moved away from the central reference point to match the interpupillary distance of the VR glasses with the user's interpupillary distance;

If the pupil distance of the user is less than the current pupil distance of the VR glasses, the first motor and the second motor are controlled to drive the first glasses corresponding to the first motor and the second glasses corresponding to the second motor to move synchronously towards the direction near the central reference point so that the pupil distance of the VR glasses matches the pupil distance of the user.

In this embodiment, the eye information of the VR glasses user is acquired by collecting. If it is determined that the user's eye information does not satisfy the visual condition of the VR glasses, the adjustment mode is determined according to the user's eye information, and the VR glasses are automatically adjusted in different adjustment modes. The visual condition of VR glasses can be matched with the eye information of the user, thus realizing automatic collection of the eye information of the user. According to the user's eye information, the visual condition of VR glasses is automatically adjusted, thus improving the visual effect of VR glasses and improving the visual experience of medical students.

The practice of socialist core values education is related to the fundamental issue of "who to train people" and "what kind of people to train". Under the new media environment, we should make use of new technology to build a long-term education mechanism of "all-round and all-round" education for medical students in the socialist core values education, so as to enhance the pertinence and effectiveness of education. Cultivate high-quality medical talents with both ability and political integrity! General Secretary Xi Jinping emphasized that "the evangelist must first understand the channel and the channel. The helmet can intuitively let the students feel the case of a living patient who has been treated! Let the medical students feel the lofty and greatness of the doctor profession!

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