Abstract

Title: Smart laser acupuncture navigation system

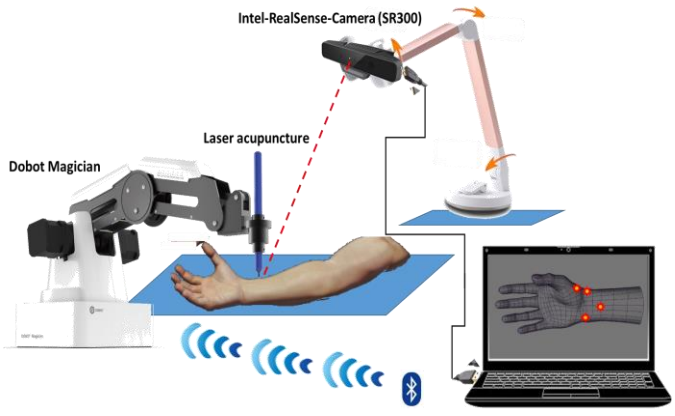
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Keywords: laser acupuncture navigation; acupoints indicator

In this study, a smart laser acupuncture navigation system, including a robot arm for laser acupuncture positioning, an intelligent human acupoints indicator, and an emulated laser acupuncture, was proposed. We used the "location of point by bone standard" method to determine the position of acupoints. An Intel-RealSense-Camera (SR300) was adopted to take 3D images of human upper extremities. The image of the upper limb taken by the realsense camera appears on the computer screen, and the 3D model of the arm image with acupoints designated were applied to indicate the position of acupoints, and virtual reality technology was used to indicate common acupuncture points on the image. Using the pixels of the obtained acupuncture points in the image and the depth information obtained by the depth camera, the coordinates of the acupoints in real world can be obtained. After determining the treatment points and process by a Chinese medicine doctor or expert system, the laser acupuncture head held by the robotic arm automatically moved to the designated acupuncture point. The image of the upper limb captured by the camera was used to apply the 3D model of the calibrated acupuncture points to the computer in a virtual reality and the position of the acupuncture point was displayed on the arm. Next, the robotic arm will perform laser acupuncture treatment according to the acupoints and courses that have been set. An emulated laser acupuncture developed by our team was used to perform acupuncture treatment for patients. The results show that the smart laser acupuncture navigation system can effectively assist laser acupuncture treatment.

I. Image:



II. Reference:

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III. Biography:

Chih-Yu Wang has completed his PhD from National Yang-Ming University and postdoctoral studies from National Taiwan University. He is a Professor of Department of Biomedical Engineering, I-Shou University Taiwan. He was majored in biophotonics, especially on laser diagnostics and treatment, such as fluorescence spectroscopy, polarized imaging, luminescence nanoparticles synthesis, and photodynamic therapy. His recent researches were mainly focused on the design and manufacture of modern instrument to implement the diagnostic and treatment methods in traditional Chinese medicine. He has published more than 40 papers in related field on reputed journals.

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