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Development of Webcam Sensors for an Acupuncture Mannequin

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Abstract

This paper develops webcam sensors for an acupuncture mannequin. Acupuncture is an ancient Chinese medical treatment that is based on experience and practice. The first acupuncture mannequin was invented in the Eleventh Century for practicing and examining purposes. In order to improve the repeatability and interactivity, we designed an acupuncture mannequin that consists of detecting sensors, electrical circuits, and a user interface to improve its functions. The model can display the pierced acupuncture point on a screen and iteratively illustrate treatments for diseases based on an expert database. In this paper, we take this model a step further and develop webcam-based sensor modules that can recognize the positions, depths, and rotations of acupuncture needles. We verify the sensors by experiments, and implement multiple sensor modules on a full-sized acupuncture model for demonstration. The results indicate that the webcam-based acupuncture mannequin is effective for detecting advanced acupuncture skills.