Warning system for wrong posture sitting by analyzing the tilt angle of the back and neck

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Abstract

Since the COVID-19 pandemic in 2020, the working patterns have been changed to be online platforms. People tend to spend plenty of time sitting in front of their computer. During this period, wrong postures may involuntarily and frequently occur. This causes a rising number of office syndrome and backache patients. This project therefore aimed to create a warning system for wrong posture sitting with a low-cost and highly efficient device by analyzing the tilt angle of the back and neck. It applies a microcontroller (Node MCU ESP8266) and digital motion processors (MPU6050) attached to user's head and back to measure the change of tilt angle of neck and back, respectively. Suitable postures in this project have been set based on the health researches. The posture allows users to tilt their heads not over 30 degrees upward or downward. Users' backs can lean backward not over 10 degrees and are not allowed to lean sideways. The system will make alarm noise when the users lean back and neck over determined values. Furthermore, the system can be operated via Wi-Fi, therefore, users will be conveniently notified by the mobile phone's application.

Keywords: digital motion processor, office syndrome, sitting posture, warning system