A Wearable Device To Measure and Correct Unhealthy Back Posture

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As a result of office work and screen entertainment, people have been sitting for long periods of time in unhealthy postures, and this has had negative physical and mental health consequences, such as greater muscle strain, joint pain, and more negative self-perception. Therefore, the engineering goal of this project was to design and build a wearable device, along with an app, to monitor people's posture and motivate them to correct it when their posture has become unhealthy. The device used the Adafruit Feather 32u4 Adalogger microcontroller and three inertial measurement units to measure sitting posture. An algorithm was implemented that would buzz several vibration motors whenever the user had remained in an unhealthy posture for a long period of time. The wearable device was built using felt and a layer of foam to protect the electronics, and the app was built using MIT App Inventor and could communicate with the device using Bluetooth. To evaluate the device and app, participants were invited to wear the device and use the app, and asked questions about the device effectiveness, comfort level, app usefulness, and app user-friendliness. The results indicated that device effectiveness and app usefulness were rated very positively, and the vibration motors were very effective. Also, app user-friendliness was satisfactory, but the comfort level had room for improvement due to somewhat abrasive neck straps, so the engineering goal was mostly met. This device will motivate people to maintain good posture for long periods of time and benefit peoples' health.

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