Multifunctional Smart Denture that Remotely Monitors Health

Published date: Oct. 9, 2020

Technology description

Wearable Device Uses Sensors to Detect Temperature and Head and Heart-Related Injuries While Tracking User’s Fitness Level

This mouth guard uses sensors to provide real-time data readout of vital signs and potential injuries sustained while playing sports. The market size for wearable fitness monitors, mainly wristbands and smartwatches, has increased by 90 percent in recent years. Although these devices monitor certain vital signs such as heart rate, they cannot record health information near the head such as concussions and heat stroke. According to Statistic Brain Research Institute, 35 million Americans between the ages of 5 and 18 play team sports, and at the high school sports level alone, there were more than 250,000 reported concussions in 2009. University of Florida researchers have created a wearable device that aids the identification, quantification, and management of head, heat, and heart-related injuries that may occur during physical activity. This device could include a software counterpart for data display and cloud storage for user tracking, and could help physicians noninvasively collect samples to test for diabetes and cancer.

Technology

This device utilizes 11 sensor channels to collect data regarding the user’s heath. This data can be sent to a master device such as a smart phone, tablet, or computer where it can be viewed and analyzed in order to ensure the safety of the user. Most wearable impact technology uses only a 6-axis inertial sensor whereas the mouth guard uses 9-axis inertial sensors to monitor lateral force and angular momentum. This allows the user to detect dangerous levels of force they may have experienced during physical activity, and it uses the Earth’s magnetic field to compensate for errors that may occur over long periods of use. The mouth guard collects data points about the user’s heart rate and blood pressure using an infrared sensor, monitors the core body temperature using a temperature sensor, measures biting force using a capacitive pressure sensor to prevent bruxism, and detects biological markers in the user’s saliva to noninvasively test for diseases.

Application area

Smart mouth guard that collects data on many common sports injuries and prevents serious aliments

Advantages

Does not require a helmet, allowing use in a wider range of sports
Uses sensors to collect biometric data , providing a noninvasive method for patients and healthcare providers
Uses a 9-axis inertial sensor, rather than the typical 6-axis inertial sensor, improving the accuracy of the data it collects

Institution

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