Wearable Device for Monitoring Health/Activity Levels

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Technology description

Background

Existing wearable technology for monitoring activity also monitors heart rates using plethysmography; however, such technology cannot detect respiration or blood oxygenation levels from plethysmograph or from the wrist. Photoplethysmography uses an LED and photodiode to measure reflected light through human tissue. Existing heart monitors and pulse oximetry sensors worn on the finger use photoplethysmography; however, respiration and pulse oximetry have not been performed on the wrist nor is respiration detected from a finger.

Technology Summary

Researchers at Purdue University have developed a wearable device, i.e., watch, that detects respiration rate, heart rate, and oxygen saturation using photoplethysmography. All physiologic measurements are obtained in a single, easy-to-access device that is worn on the wrist. In addition, it can monitor exercise and disease states, such as drug overdose, asthma, seizure, or other health issues, affecting respiration, heart rate, and/or oxygen saturation. In addition, this device calls for emergency response when a drug overdose is detected, breathing/heart rate stops, and/or oxygen saturation drops below an acceptable threshold. This technology makes advances beyond the popular wearable watch that monitors activity, by using technology that monitors an individual's physiologic state and disease state and calls for emergency response.

Application area

Monitor health/activity
Detects respiratory rate, heart rate, and oxygen saturation
Detects drug overdose

Advantages

Wearable on wrist
Physiologic measurements
Monitors and detects drug overdose and disease states affecting respiration, heart rate, and/or oxygen saturation
Calls for emergency response
Potential integration with existing technology

Institution

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