



sensors



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Advanced Signal Processing in Wearable Sensors for Health Monitoring

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Smart, wearables devices on a miniature scale are becoming increasingly widely available, typically in the form of smart watches and other connected devices. Consequently, devices to assist in measurements such as electroencephalography (EEG), electrocardiogram (ECG), electromyography (EMG), blood pressure (BP), photoplethysmography (PPG), heart rhythm, respiration rate, apnoea, and motion detection are becoming more available, and play a significant role in healthcare monitoring. The industry is placing great emphasis on making these devices and technologies available on smart devices such as phones and watches. Such measurements are clinically and scientifically useful for real-time monitoring, long-term care, and diagnosis and therapeutic techniques. However, a pertaining issue is that recorded data are usually noisy, contain many artefacts, and are affected by external factors such as movements and physical conditions. In order to obtain accurate and meaningful indicators, the signal has to be processed and conditioned such that the measurements are accurate and free from noise and disturbances.

In this context, many researchers have utilized recent technological advances in wearable sensors and signal processing to develop smart and accurate wearable devices for clinical applications. The processing and analysis of physiological signals is a key issue for these smart wearable devices. Consequently, ongoing work in this field of study includes research on filtration, quality checking, signal transformation and decomposition, feature extraction and, most recently, machine learning-based methods.



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