Advances in Muscle Fatigue Detection: A Comprehensive Review

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Abstract

Muscle fatigue measurement is crucial in various domains, including occupational health and safety, as muscle fatigue adversely affects cognitive and motor performance, leading to reduced productivity and increased injury risks. Wearable systems offer promising solutions for muscle fatigue monitoring, enabling continuous and long-term assessment of biomedical signals in unattended settings with comfort and non-intrusiveness. These systems facilitate performance optimization, injury prevention, training load management, individualized training programs, rehabilitation and recovery. Surface electromyography signals are commonly utilized by some systems to extract features and classify muscle fatigue. Additionally, the utilization of goniometers, which are used in kinematic analysis, and other innovative approaches like tissue Doppler imaging, demonstrates promising potential for detecting localized muscle fatigue in wearable devices. This review article explores the challenges and advancements in muscle fatigue monitoring through wearable devices and discusses the diverse applications of these technologies

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