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Virtual Award Ceremony

8th November 2023
Wednesday

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Quantitative Spasticity Assessment Model of Neurological Disorder Patients

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***Abstract*—Patients with neurological disorders usually experience conditions where their muscles are stiff, tight, and prone to resist upon stretching, which in essence defines muscle spasticity. The current method of muscle spasticity assessment is based on subjective assessment by therapists who rely on their inner intuition, experience, and skills that comply with the Modified Ashworth Scale tool. This leads to inconsistency in assessment and could affect the efficacy of the rehabilitation process. Although current trends quantify the clinical assessment with some positive results, they have been shown to pose challenges in identifying the significant spasticity characteristics to produce a proficient model of muscle spasticity characteristics of neurological disorder patients by ignoring the composition of the measured signals. Thus, the research's main objective is to develop the spasticity muscle characteristics model based on Modified Ashworth Scale (MAS) scores from forearm musculature using Mechanomyography (MMG) signals. The cues from the MMG signals pattern will be used to select the sampling features for the development of the classification algorithm model. A customized non-invasive MMG device will be used to collect the signal characterizations from patients with different scores of MAS clinical assessment. It is envisaged that the main output of the research is a novel spasticity muscle characteristics MAS model-based. The impact of this research can serve significantly as the standardized and objective assessment tool for measuring the muscle spasticity level of the affected limb. Hence warranting a more effective rehabilitation process and reduction in overall expenditures pertaining to saving cost, time, and energy.**

***Keywords*—Spasticity, Modified Ashworth Scale, Machine learning, Mechanomyography signal**

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