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Quantitative Measure of The Functional Ability Index Using Activity of Daily Living Based on Motor Activity Log

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Abstract

The assessment in evaluating a stroke patient's ability done by the doctor and therapist provides an important information that is valuable in guiding treatment plans, determining the appropriate levels of stroke severity, and identifying areas where interventions are needed to improve a patient's functional ability. However, the current manual method for assessing stroke patients in occupational therapy is subjective and inconsistent, as it relies on the therapist's individual expertise and experience. To address this issue, this paper presents a pilot study on a quantitative measure of Functional Ability Index (FAI) utilising activities of daily living (ADL) based on the Motor Activity Log (MAL) clinical assessment. The Pearson correlation technique is implemented to measure the relationship between variables and normalisation function is adopted for stroke patient's FAI estimation to describe their capability. Ten ADLs from MAL assessment have been selected for this

study. Data on force exerted, arm movement, equipment motion during ADLs, and the time duration to execute the ADL task have been collected from 30 healthy subjects and 56 stroke patients. Sensors of force, IMU, encoder, and distance have been employed for this purpose. The estimated FAI's are then compared to the manually scored given by the therapists. The results indicate that the highest achieved accuracy is 77% for the ADL 'Fan Regulator'. These results demonstrate the feasibility of the method for establishing a quantitative measure of FAI. © 2025, National University of Malaysia. All rights reserved.

Author keywords

Activity of Daily Living; Motor Activity Log; Occupational Therapy; Statistical Analysis; Stroke Rehabilitation

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Abstract

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