

Assist-as-needed (AAN) robotic rehabilitation strategy based on subject functional ability

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Abstract

Assist-as-needed (AAN) robotic rehabilitation therapy has an extensive and profound impact on individuals and society, changing the conditions for physiotherapy and patient, and promotes neural plasticity and motor coordination through active participation in functional task. The technique significantly improves recovery of lost neural function following neurological impairment such as stroke. Despite the widespread use and importance of this type of mechatronics integrated approach, in everyday life it is still relatively unexplored. In this talk, I will present a vision of the robotic therapy computing that breaks free of this fundamental constraint. In this vision, a key component of this strategy is to provide robotic assistance to the patients only as it is needed. Thus, consistent and accurate estimation of the patients' functional or movement ability (FA) is required to adequately evaluate the patients' need for robotic assistance or the amount of assistance torque to be provided. However, several strategies have shown inconsistencies in their estimation techniques and often significantly influenced by interferences and disturbances from the robotic device, making them unsuitable for clinical applications. The previous methods are also not related to clinical assessment scales in clinical practice. With the use of an assist-as-needed (AAN) control strategy for robotic rehabilitation based on a formulated Functional Ability Index which adequately estimates patients' functional ability tasks movement. This has the potential to significantly be consistent with the clinical setting. Preliminary results confirm that a critical aspect of this robotic method, namely an assist-as-needed (AAN) control strategy, is achievable through a technique called Functional Ability Index (FAI).

Biography

S. Y. A. MOUNIS received the B.S., M.S. and PHD degrees in mechatronics engineering from International Islamic University Malaysia, Kuala Lumpur, Malaysia, in 2011, 2015 and 2020 respectively. He is currently working toward the post-

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