CoMoveIT Smart: How Can AI Empower Independent Mobility for People with Severe Movement Disorders?

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Summary

This session will showcase the scientifically underpinned development, validation, and clinical impact of CoMoveIT Smart, a novel head-foot steering system for individuals with severe complex movement disorders. Experts from engineering and rehabilitation fields will offer a comprehensive view, from development phases to real-world clinical applications. A young adult with lived experience, one of the first CoMoveIT Smart users, will highlight the benefits and challenges associated with independent mobility as a pillar of improved quality of life.

Abstract

Worldwide, an estimated 18 million people are diagnosed with cerebral palsy, one of the most prevalent childhood-onset disabilities. Within this population, around 5.4 million manifest with complex movement disorders that severely impact motor control and coordination. Consequently, the vast majority cannot steer a powered wheelchair using conventional control devices such as joysticks, chin steering, or mechanic switches. Fortunately, the existing basal control of the head and (potentially) of the foot renders the possibility of independent mobility for people with complex movement disorders.

CoMoveIT Smart is a unique wheelchair steering system that utilizes Artificial Intelligence to empower individuals with complex movement disorders through independent mobility. Developed from collaborative research at KU Leuven, Belgium, in 2017, CoMoveIT addresses the significant challenges faced by many individuals diagnosed with severe cerebral palsy who struggle with conventional methods of wheelchair control. CoMoveIT Smart, which features head-only or head-foot steering, was developed by integrating scientific insights and evidence in close collaboration with users. It has received high praise from therapists and users for its usability and functional impact. With its adaptive algorithm, which filters out the fragmented, uncontrolled involuntary movements and translates them into a smooth driving, and personalized configurations, CoMoveIT Smart offers a controlled driving and therapeutic driving experience, promoting symmetry and independence while facilitating societal participation.

Proposed schedule and topics

Introduction of speakers.

Introduction and statement of the problem of mobility in complex movement disorders.

Instrumented sensor evaluation of wheelchair driving performance and adaptive wheelchair control.

Clinical evaluation of wheelchair driving performance and training.

A lived experience using powered wheelchair drive input devices.

Interactive discussion with the audience about their experiences, challenges and approaches on mobility for individuals with complex movement disorders.

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