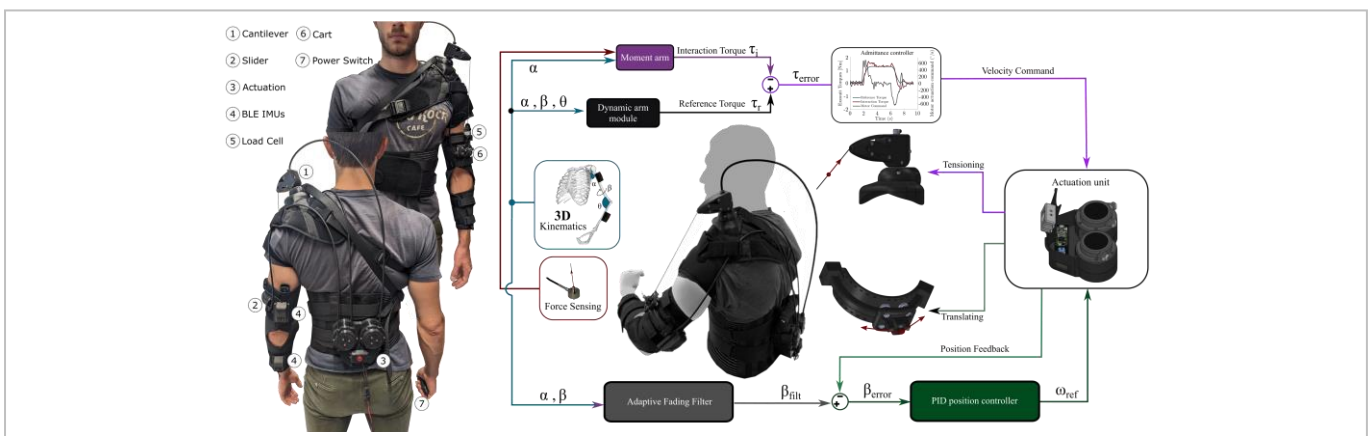


User-wearable actuated orthosis – powered exosuit

Technology Offer

Ref. No.: 1004-23



Category

actuated orthosis

Keywords

exosuit, orthosis, robotic soft suit

Development stage

working prototype

Seeking

licensing

IP status

pending

Background

Existing shoulder-support exoskeletons are predominantly rigid, parallel-mounted and passive devices. These systems are often heavy, voluminous, and uncomfortable, limiting their deployability in industrial and rehabilitation contexts.

There is a growing need for lightweight powered orthoses capable of providing functional support without restricting mobility. Therefore, the invention is about a wearable robotic soft suit for shoulder able to assist users while performing strenuous tasks in rehabilitation or in a working environment.

Technology

The invention introduces a powered soft robotic shoulder orthosis capable of providing two degrees of freedom of shoulder assistance, namely flexion-extension, abduction-adduction and combined motions, using a single tendon-driven actuation unit. Furthermore, the Invention offers an intention detection. This technical advancement results increased system

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efficiency and a reduction in overall device weight, enabling full assistance modulation at the joint. Furthermore, the lightweight structure of the suit provides an enhanced comfort and user experience.

Benefits

- reduced weight compared to the state of the art
- integrated intention detection enhances usability through responsive control
- increased comfort and wearability due to soft, non-rigid exosuit architecture
- assistance proportional to the 3D arm orientation of the user
- can be easily adapted to different body shapes and sizes – modular and adjustable components

Applications

- Rehabilitation therapy for patients with impaired shoulder mobility
- Assistance for workers performing strenuous or repetitive tasks.
- Prevention of musculoskeletal disorders in industrial settings
- Support for aging population or individuals with mild motor impairments
- Training for movement patterns for various sports

Publications

- 40th Anniversary of the IEEE Conference on Robotics & Automation – Live Demo: Tendon-Driven Exosuits for Upper and Lower Limb Assistance

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