

Soft Exoskeleton Elastomer Pre-Tension Drive Control System

Authors : Andrey Yatsun, Andrei Malchikov

Abstract : Exoskeletons are used to support and compensate for the load on the human musculoskeletal system. Elastomers are an important component of exoskeletons, providing additional support and compensating for the load. The algorithm of the active elastomer tension system provides the required auxiliary force depending on the angle of rotation and the tilt speed of the operator's torso. Feedback for the drive is provided by a force sensor integrated into the attachment of the exoskeleton vest. The use of direct force measurement ensures the required accuracy in all settings of the man-machine system. Non-adjustable elastic elements make it difficult to move without load, tilt forward and walk. A strategy for the organization of the auxiliary forces management system is proposed based on the allocation of 4 operating modes of the human-machine system.

Keywords : soft exoskeleton, mathematical modeling, pre-tension elastomer, human-machine interaction

Conference Title : ICWRE 2024 : International Conference on Wearable Robotics and Exoskeletons

Conference Location : Tallinn, Estonia

Conference Dates : May 20-21, 2024