

Control design of a de-weighting upper-limb exoskeleton: extended-based fuzzy

ABSTRACT

One of the most common issues to human is fatigue. A technology known as exoskeleton has been identified as one of the solutions to address this issue. However, there are two issues that need to be solved. One of them is the control approach. Hence, the main aim of this work, is to investigate the control design for upper-limb exoskeleton. An extended based fuzzy control is proposed to observe the effectiveness of the exoskeleton in dealing with human with different strength. Three conditions of human strength were applied. PID was used for a comparison purpose. It is shown that with the proposed control approach, the exoskeleton can assist human to achieve the desired trajectory accurately with a minimal amount of torque required.

Keyword: Control approach; Extended-based fuzzy control; Fuzzy logic control; Muscle fatigue; Upper-limb exoskeleton