Control Input Converter for Robot's Leg Joint with Parallel Actuation Configuration

Irawan, A., Hoe Lih Jiun ; Alam, M.M.
Faculty of Electrical & Electronic Engineering, Universiti Malaysia Pahang, Kuantan, Malaysia

ABSTRACT

This paper presents the proposed control input converter (CiC) for robot leg's joint control with parallel actuation. The parallel actuation commonly used in heavy machine such as backhoe and bulldozer. This configuration performing muscle-based movement since the actuator attached becoming part of the frame. Therefore this particular switching mechanism is designed to translating a desired signal to the linear actuator from any close-loop control input. This simple algorithm is developed from the behavior study of the attached linear actuator motion on each crossed joint angle. The verification is done on actual leg of Quadruped Parallel Leg Actuation (QPAL) robot system by using a real-time target embedded system with focusing on foot motion for each leg and joint angle position error tracking from some angle inputs.

KEYWORDS: Actuators; Closed loop systems; Convertors; Earthmoving equipment; Embedded systems; Legged locomotion

DOI: 10.1109/ICECE.2014.7026865