

A novel approach for classification of underactuated mechanism in myoelectric hand

Abstract

Concept of underactuation makes it possible to create such robotic hands that automatically adapt to the shape of the grasped object without using a complex control system or a large number of actuators. In underactuated hand prostheses, depending upon control strategy used, one can get more and more degree of freedoms (DOFs) to make its prosthetic device more versatile and easy to control. In spite of all the great work done by the researchers on underactuated prosthetic hands, no one has given any relationship between the number of motors (or actuators) and the number of degree of freedoms (DOFs). This novel concept named as "Coefficient of UAM" (CoUAM) is "the ratio between numbers of motors to the number of DOFs". By reviewing various known studies, CoUAM of randomly selected prosthetic hands is calculated separately and analyzed merits/demerits, cost, weight, appearance, ease of controllability and their functionality to make this approach more objective and useful for the future researchers. Hence target of this paper is to assess a Coefficient of UAM (CoUAM) of different types of prostheses available and then classify them into red, green and yellow zones.