

PROGRAMMABLE PROSTHETIC CONTROLLER

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ABSTRACT

Powered prosthetic hands, elbows and wrist rotators for child amputees have begun to proliferate and gain acceptance over the past few years. While the options for controlling these devices were once limited, there are now many commercially available alternatives. Amputees can use a variety of inputs such as myoelectric electrodes, switches or pressure sensitive pads. If the amputee can control two inputs for each prosthetic joint, the control scheme is relatively simple. If, however, the number of movements to be controlled exceeds the number of inputs a more complex control scheme must be selected. For example, for an above-elbow amputee to control a powered hand and a powered elbow with myoelectric inputs from biceps and triceps muscles, the biceps signal can be used to flex the elbow and the triceps signal can be used to extend the elbow. Coactivation of the inputs or activation of an auxiliary switch can switch control to the hand. Alternatively, a rate-sensitive system can be used in which fast muscle contractions are used to control the hand and slow muscle contractions to control the elbow. There are a large number of variations on these schemes and choosing the right one for a particular amputee is a significant challenge.

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