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## Sensory Systems in Micro-Processor Controlled Prosthetic Leg: A Review

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### Abstract

Micro-processor controlled prosthetic legs (MPCPL) offer better functionality than conventional prosthetic legs as they use actuators to replace missing joint function. This potentially reduces the user's metabolic energy consumption and normal walking gait can be mimicked as closely as possible. However, MPCPL require a good control system to perform efficiently, and one of the essential components is the system of sensors. The sensory system must satisfy two important criteria; the practicality in donning and doffing the prosthesis, i.e. the process of putting on and taking off the prosthesis by the amputee user, and the quality in the information provided. In this paper, a comprehensive review was conducted on studies related to the state of the art of sensory system adopted in MPCPL. The publications were searched using four electronics databases within the last 13 years. A total of 31 papers were reviewed. The articles were classified into three main categories: prosthetic-device oriented, user's-biological-input oriented and neuro-mechanical fusion sensory system. Types of sensors used and their application to the prosthetic system were analyzed. This review indicates that the sensors technology reported in the literature still does not fulfil the criteria of an efficient sensory system. Hence, a sensory system that eases the don and doff process of the prosthesis, yet informative in terms of providing enough useful data to effectively control the prosthesis, is needed for a successful MPCPL.

### Keywords

**Author Keywords:** [Prosthetics](#); [sensor](#); [microprocessor-controlled prosthesis](#)

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