Regenerative Interface Electrode (UTARI))

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Technology description

Technology Need

Over 1.7 million people suffer from limb loss in the US, and this number increases by 185,000 each year. A 2010 study reported one of the main reasons for dissatisfaction of a prosthetic limb was "lack of functionality," and that about one fifth of the subjects in the study abandoned their prosthesis. In an effort to increase the functionality of prosthetic limbs, researchers attempt to connect devices to the patient's nervous system. Ideally, this allows for information to flow from the patient's brain directly to the device and vice versa. Yet, thus far no neural interface has been able to provide its users natural motor control or feel. One reason for this is that the interfacing electrodes do not have the ability to distinguish between sensory or motor neurons.

Invention Description/Solution

Researchers in UTA and UTARI have developed a regenerative interface electrode (RIE) that can measure conduction velocity of the nerve fibers that the RIE interact with. The device stimulates peripheral nerve growth into close proximity with its interfacing electrodes allowing for nerve fibers to be stimulated, fiber electric-activity measurements, and the distinguishing between sensory and motor nerve fiber types. The design is modular to allow for a variety of uses such as a diagnostic tool for clinical pathologies of the peripheral nervous system or a controller for a prosthesis.

Application area

Advanced Prosthetic Limbs
Diagnostic Tool

Advantages

Enables brain signals to be delivered to a device
Potential increased functionality of prosthetic limb
Distinguishes between sensor and motor nerve fiber types
Modular design to increase its applicability

Institution

University of Texas, Arlington

Inventors

Young-tae Kim
Mario Romero-Ortega

联系我们

叶先生

电 话：021-65679356
手 机：13414935137
邮 箱：yeyingsheng@zf-ym.com