The Office of Technology Management

UNIVERSITY OF TEXAS ARLINGTON

Tech ID: UTA 16-24

Improved control method for prosthetic devices

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TECHNOLOGY NEED

Surface electromyography (sEMG) has been shown to be a robust and reliable interaction method allowing for basic control of powered prosthetic devices. However, prosthetic users with severe level of amputation require complex devices and more degrees of freedom than sEMG control inputs can provide. For these users, the available sites for sEMGs are limited. Recent studies show a marked decrease in EMG-classification efficiency throughout activities of daily life due to socket shift and movement and fatigue as well as changes in degree of fit of the socket throughout the lifetime of a subject.

INVENTION DESCRIPTION/SOLUTION

UTA researchers have developed novel methods of controlling upper limb prosthetics with multiple degrees of freedom. The control methods combine the use of electromyography with intact hand based control. This includes two modalities: mirroring of intact hand movements to the prosthetic device, and the use of extremely lightweight fingernail mounted devices on the intact hand to select pre-defined poses on the prosthetic hand. The user determines the modalities appropriate for a particular activity. With the inclusion of the mirroring feature, a user can seamlessly perform activities which naturally require both hands to be doing the same thing. Also, a control method which correlates sEMG data with intra-socket pressure data was developed. Using this data fusion algorithm, a significant improvement in input data classification was demonstrated. The developed approach also allows unilateral amputees who can't generate sEMG signals to control robotic prosthetic devices.

APPLICATIONS

- Human Machine Interfacing
- Prosthetic Device Control
- Virtual reality

KEY BENEFITS

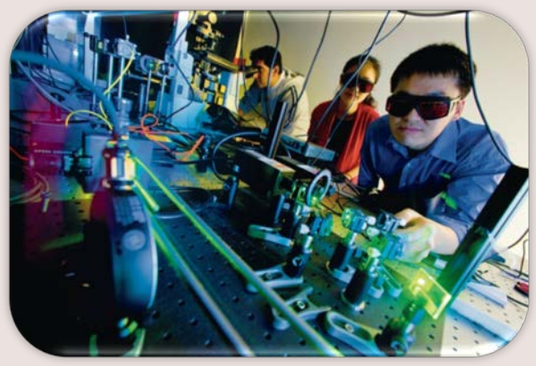
- Increased viability of prosthetic control inputs
- Extending the usability of robotic prosthetics to new populations
- Real-time generation of grasp patterns
- Applicability to other wearable electronics

STAGE OF DEVELOPMENT

Prototyped and tested

INTELLECTUAL PROPERTY STATUS

Provisional



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