Neuroprosthetics: Restoring Ability and Enhancing Accessibility

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Neuroprosthetics offer more advanced functionality compared to traditional prosthetics, but their high cost and invasive procedures limit accessibility. This research focuses on developing a low-cost, non-invasive neuroprosthetic that retains key advantages like sensory feedback and precise control. A prototype was built for under $150, using surface electrodes to detect muscle activity in the Extensor Carpi Radialis and other muscles. The device provides haptic feedback and temperature feedback to the user, making their prosthetic more advanced and improving the quality of their life. The study uses experimental research, testing the prototype's accuracy and responsiveness with two different microcontrollers, as well as qualitative research, which was collected by interviewing experts in the field. The study suggests non-invasive methods can offer effective control and feedback at significantly lower costs. Future improvements aim to add tactile feedback, making the prosthetic more advanced. This research highlights the potential for affordable neuroprosthetics, increasing accessibility for amputees worldwide while advancing the field of prosthetic technology.

Awards Won: