A Functional, Inexpensive Bionic Hand with Feelings

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Modern technology and especially bionics has come a long saying recent years. Unfortunately these devices are still extremely expensive and require extensive customization. These factors combined mean that many amputees in developed countries and especially in the third world don't have access to them and thus can't regain a normal quality of life. This project aims solve this problem by creating a bionic hand that works right out of the box, has state of the art functionality and is so inexpensive that even the poorest parts of the world can afford it. In order to claim "state of the art" functionality I set forth the following goals: * Seamless, invisible control * Able to perform complex grips * Let the user feel what the hand is "feeling" * Generate intuitive, seamless biofeedback * Adaptible to many different situations Since it must also be usable anywhere in the world without extensive customization or maintenance, it must also: * Require no special training * Be completely non invasive, requiring no medical procedures * Be easily maintainable The result of my work is a bionic hand with a material price of less than $200 that lives up to all the goals. The hand is controlled seamlessly using a special type of optomyography that I developed, it can sense touch and recognize when it is touching a wet, metallic or human surface. Furthermore, I have found ways to emulate the proprioceptoric sense which allows the biological hand to better cooperate with the bionic hand. It can also generate non-invasive, intuitive biofeedback, as well as sensing the basic shape and size of an object, and whether the hand is about to lose an item. Using a gesture based system, the hand can also adapt to almost any situation.

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