The Future of Mechanical Prosthetics: Electromyogram Controlled Extremities

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More than one billion people worldwide are disabled and they often try to overcome shortcomings to continue their daily lives. “The prosthesis makes no pretense of trying to replace the lost limb physiologically; it’s there as an aid to provide some of the functions that were lost.” (Weir, 2004). The mechanical hand is considered the most efficient prosthesis because of its design and functionality. However, not everyone is able to acquire the most efficient technology in the market. This research offers a solution by developing a low cost mechanical hand. The hand was designed in a 3D modeling software with the actual dimensions of a human hand and then each part was assembled. With the MYO armband the electromyographic waves of the human arm were received in a cellular device and then sent to the Arduino microcontroller where the commands were sent to the motors, so the assembled 3D printed model of the hand could move. Movements such as: finger tap, finger spread, rest, fist and grabbing were programmed and tested by the researchers. The prosthetic device worked as efficiently as an invasive mechanical hand using only electromyographic waves to imitate the movements of a real human hand, without the need of any delicate surgical procedure to install the prosthesis which could lead to life risks. With this innovative idea, there will be a direct impact on disabled people that will change their lifestyle and bring them closer to a natural human way of life at a more affordable cost.

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