Prosthetics are artificial body parts designed to replace body parts missing from birth or lost in an accident. Robotics has made Prosthetics closer to real human limbs. Prosthetics have come a long way from the days of solid plastic replicas with advances such as carbon fibre allowing making lighter and most robust limbs. Other advances such as robotic fingers that can move, pick up small or delicate objects and in more recent cases experience feeling through their hands. The movement of the bionic arm is done by wiring up electrodes to nerves on the person’s muscles that send singles for the arm and fingers to move. The electrodes transfer the signal to a computer which interprets those signals into movements for the arms.

The research in myoelectric (electrical impulses released by the muscles) have meant that bionic arms require any surgery and can be slipped on an off to the comfort of the person. 3-D printing has allowed people who wouldn’t be able afford high tech hands to purchase cheaper or create their own hands that still have some functionality. It also allows companies to quickly make light weight limbs that fit the person’s stump perfectly. The University of Utah developed the LUKE arm (in reference to Luke Skywalker’s arm) that replicates the feeling of force on an object to the brain. This allowed the man to “pick up an egg without cracking it”. It replicates this feeling by creating an array of microelectrodes that reads the person’s movement while also sending back a specific set of impulses to the brain to emulate the ability to feel.

The main benefits to bionic legs is that they allow ankle control, pressure feedback and knee flexibility. They measure what is left of the leg and create a model that will fit the person’s exact height. Much of the technology which is used for the legs are similar to the arm being used for ankle control and pressure feedback. Knees are controlled via a microprocessor which calculates the knee’s angle by using sensors which then moves the knee up or down by hydraulics within the knee joint.

Bionic enhancements can not only make an equal to people with all their limbs in with some cases then can make them better. Exo-suits are “wearable technology that conforms to the human figure” and are designed to enhance a human’s strength. They can help people with a weaker body move with the help of robotics, be used in construction or military. Exo-suits such as The Leg Squad Support System by Boston Dynamics allows soldiers to walk 20 miles in a 24 hour period while carrying 180kg of cargo. These exosuits may be loud due to the engines and require large power supplies. Advances in power supplies or the efficiency in which the suit uses the power may decrease the weight in the future making the suits even faster. The decreased strain allows people to more efficiently use heavy machinery more quickly meaning certain companies may invest in exosuits to improve productivity. This decreased strain also decreases the risk of workers doing long term damage to their body. Bionic limbs have since massive development in recent years and the future of bionics will hopefully make a lot of people’s lives a lot easier.

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