A Prosthetic Problem

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Since their infancy, prosthetics have been used to assist those wounded or born with an issue like limb reduction defect which causes infants to be born without certain limbs. As history took course more and more advances were achieved, prosthetics took less of just a stick shape and began to resemble the body parts that they were supposed to serve as. Along with shape, new technology has also been implemented into prosthetics that allow them to become less robotic and more humanlike. My challenge to overcome is to make prosthetics so humanlike that it is impossible to differ between an assistive device and an actual limb. Although there have been many advancements in the way that these devices look they still aren't completely humanlike and that's what my solution is going to fix.

I want to create a prosthetic limb that is exactly like a natural limb that has muscle, skin, bone, and movement. The limb could use preexisting technology along with new technology made from the aspects of STEM. Science and technology would take a lead part in the new prosthetic but math and engineering would also be used as it would take a lot of tests and math to program the robotic limb, and also math to measure each part of the assistive device and to implement them accordingly.

One challenge for people that have prosthetics is that their device isn't what looks like and feels like a normal limb. Prosthetics are very necessary because every year more than 125000 people lose a limb to an accident or disease. People that have these prosthetics need them to help them do daily tasks that seem simple to most but are almost impossible to those who are injured without prosthetics. But, although they help with daily functions, there are still a lot of improvements that can be put into the prosthetics that can help them to become devices that can make people practically forget they even are using a prosthetic limb. The amount of things that can be done is limitless and already in place by scientists and bioengineers.

So to fix my challenge part of the solution is already using in place technology. There is already an artificial hand that can use sensors to send messages between the brain and the hand and can be used to feel and touch objects. One problem with this hand though, is that it appears very robotic like and doesn't look like a normal hand at all except for the actual model of it, but it has many wires and cords extending from it which gives the hand the appearance of a machine. To fix this, there is already work being done on a hand that uses a special type of silicon to give the user a very humanlike hand look, and to make it nearly impossible to differentiate between that of a real hand and an artificial hand. My solution to this problem is that we combine all of the technology used in both of the prosthetics to make a hand that looks like a natural hand and can feel things like a natural hand.

By creating a hand using the technology found already in both of these hands, it would be possible to move on into deeper parts of the hand, as it already can feel and look like a natural hand. So, with the technology combined, it would be easy to transition into more limbs such as legs, arms, and even feet. And once made, these other limbs can be infused with even more technology as it's made, such as my idea that we can implement artificial muscle and bone to add structure and support to the artificial limb, and to make it so that if the device gets cut or damaged in any way, the wound will appear as a natural wound would, and heal itself. But, how

can a wound heal itself if it's artificial?

The answer is simple, starfish. Starfish, scientifically known as the asteroidea have amazing regeneration abilities which can help them to, if their limb comes off, practically regrow their entire limb. The process of this regeneration is known as cell proliferation or, the growth and reproduction of similar cells. Once done with this process, starfish have successfully healed their wounds and made an entire new limb. They do this from part of the starfish known as the central disc, which means that, if made, an artificial central disc could be able to help create a prosthetic that can regenerate if cut, ripped, or sliced in any form, resulting in the opening of part of the prosthetic or resulting in complete removal of a piece of the prosthetic.

The issue with this though is that not that much research has been put in to a connection between starfish regeneration and regeneration in humans. Although in theory it is possible, there isn't enough research to support that. That is why STEM would be needed, specifically engineering as there would be a lot of trial and error taking place to find out if prosthetics could regenerate the same way starfish can if put under the same conditions. Engineering would also be a needed part of the testing as it would be impossible to test the prosthetics without actually making them and testing them by cutting into the prosthetics and waiting as they attempt to regenerate and if they do not. Take the failed product and improve it so that eventually with enough improvements, it could function.

Another key part of STEM that would be needed to test these things would be mathematics. Without math it would be impossible to keep up with research easily because you need math to make graphs and charts to display data from each test on the prosthetic. Math would also be a very important step as you need to measure each individual part of the prosthetic to help you get sensors in the correct position, and to make sure the skin around the prosthetic is in the correct spot that is needed for the artificial limb to be successful.

The next implementation of stem would be in the way of science. Science plays a critical role in the success of the prosthetic device as chemistry and biology are all under science. Without the chemistry, the device wouldn't be able to use chemical reactions that can help the device to serve each function that it is used for. Biology is also important as the device needs brain waves to relay messages back and forth from the device, which allows it to be controlled by the brain from each message telling the device how to function.

Without technology there would be no prosthetic in the first place. Technology is the most important part of my device as without it the prosthetic limbs can't function at all because there isn't any signals being passed between the brain and the actual limb itself which means, that there is no way to control the prosthetic to function like a normal and natural human limb which would defeat the entire purpose of making a prosthetic that is basically supposed to serve as a limb.

With all of these ideas, research is still needed to see if the prosthetic would, and can work. Even though it may take multiple years to develop, we already have technology in place to start from. We have many adaptations that we can implement into the new version. By using preexisting parts and technology along with, ideas and tests already conducted. It is possible that

a prosthetic could practically become a human limb, and with that opens many new and helpful devices that can ultimately make life easier for those who need prosthetics, and make tomorrow's world a brand new and amazing place for its civilization.

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