

HAL 5

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Yoshiyuki Sankai and researchers at Tsukuba University in Japan have brought science fiction to reality with their new product, the HAL 5. This Hybrid Assistive Limb has been researched and developed over the past 14 years. It has been created in the form of an exoskeleton that can be worn by a person.

Yoshiyuki was inspired to create such a machine for a couple of reasons. At a young age he became intrigued by the book "I, Robot" and he loved the fact of humans interacting with machines. When becoming a student at Tsukuba University he became inspired by students with paralysis trying to move around. It was at this point he decided to work on something to help these people. This is when he came up with HAL. The purpose of the robotic suit is to allow physically disabled people and care workers to be able to move and lift objects with ease.

According to Cyberdyne, Inc., established by Yoshiyuki, the HAL 5 is one of the first cyborg-type robots controlled by a unique Hybrid System. This system is not only a voluntary control system, but also an autonomous control system. The way in which this robotic system operates is by figuring out what the user's muscles are doing and then reacts. To do so, command signals sent from the brain travel to the muscles through motor neurons which allows a person to have movement. The machine is able to detect these faint signals through the skin and sends them to a computer attached to the suit for the signals to be calibrated. From here, the computer assists and even controls the body's movement and power. The suit can sometimes interpret these signals so quick that the suit moves before the human muscle does.

Not only is movement easier with this suit, but so is its lifting power. This suit has the potential to lift up to 10 times the weight than someone normally can. The amount of weight that someone can pick up using this suit all depends on the person's original power. According to researchers, the latest robot suit can carry a 150kg load easily. The great feature about its lifting capabilities is that the suit is controlled by an assist ratio. This ratio is usually set to 50%, 60% or 70%; however, for those that are really weak and need great assistance, the assist ratio can be set to 90%.

This breakthrough is a step in the right direction for much of the technology that is being developed today. Yoshiyuki says that the product will not be for military use but to help individuals. However, this product can lead to further advancements in military equipment through investigating such inventions like HAL. By having a machine that reacts off the movement of a person's body, the life of those that are incapable of moving like the average human being is greatly improved.

Developers of HAL 5 have just newly released this product for the public however, there was no set cost. Depending on the region you live in, the cost of HAL 5 can be anywhere between \$14,000 and \$19,000. However, there is a set rental fee for a two-legged suit at \$2200 per month and a one-legged suit at \$1500 per month. The downfall for such a useful machine though is that it is only available in Japan and it is unclear whether it will be available anywhere else in the world.



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