

Brazil to Implant World's First Robotic Arm into a Human

Contributed by Marina Sarruf
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The Syrian-Lebanese Hospital, in the southeastern Brazilian city of São Paulo, is going to perform the first surgery in the world for implantation of robotic arms into a human being, to be moved by brain signals.

The agreement for realization of the surgery was signed last month with the Santos Dumont Association for Support to Research. The surgery is scheduled to take place in three years.

"This is an innovative technique which is going to bring a great advance," stated the hospital's corporate superintendent, Maurício Ceschin.

According to him, this was a great discovery that has been developed by Duke University, in the United States, and coordinated by Brazilian neuroscientist Miguel Nicolelis, who is the director of the Neuroscience Laboratory at the university and established the Santos Dumont Association.

According to Ceschin, the technique consists on implanting a microchip into the human brain to translate the nerve pulses into electric pulses, making it possible for the patient to move robotic prosthetics.

Tests were made at Duke University on monkeys that had electrodes implanted into the regions of their brains that are associated with movement.

The monkeys underwent an experiment in which they had to control a joystick and accompany the trajectory of a cursor on a computer screen.

The cursor movements were transmitted to a robotic arm that was installed in a room in front of the one in which the monkey was.

The second step was to remove the joystick from the monkey, who then noticed that the cursor was moved by brain waves, as if it were an extension of its body.

Nicolelis believes that the adult brain has such a great adaptation capacity that it is possible to incorporate an external member.

In Brazil

According to Ceschin, up to the execution of the first surgery for implantation of robotic arms moved by brain signals, the Education and Teaching Institute of the Syrian-Lebanese hospital will have a laboratory turned to research in neuroscience, where new tests will take place before the first surgery.

The superintendent also stated that a team of hospital neurosurgeons is getting ready to apply the new technique. "It will still take between two and three years for tests to be concluded on animals. The doctors must feel secure," he said.

Nicolelis established the Santos Dumont Association for Support to Research to present this new project in Brazil. He created an international network of neuroscience institutions, based in Switzerland, and the Syrian-Lebanese hospital is part of this partnership, together with centers in the United States, Jerusalem, Japan and Natal, in the northeastern Brazilian state of Rio Grande do Norte, where the project is still being developed.

The Mentor

Miguel Ângelo Laporta Nicolelis was born in São Paulo, graduated in medicine from the University of São Paulo (USP), where he also got a doctor's degree in neurophysiology. Nicolelis also got a doctors degree at Hahnemann University, in Philadelphia, United States.

Nicolelis currently runs the neuroscience laboratory at Duke University, which is considered the largest laboratory in the sector in the world. At the same university he is the Neurobiology and Biomedical Engineering chair, and joint director of the Neuroengineering Center.

Duke University is in the city of Durham, in North Carolina and its history began in 1838, when it was a rural school. The university is currently one of the main education, research, and medical care institutions in the world.

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