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Robotics research: Enhancing the lives of people with disabilities

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Robots may be the solution for people with disabilities who are struggling to regain the use of their limbs, thanks to a research team that includes engineers and students from Rochester Institute of Technology.

The study utilizes physiological information, or bio-signals, produced by the human body, to improve the performance of external assistive devices, called orthoses, which aid individuals with physical disabilities, such as strokes or major spinal cord injuries, regain the use of there arms and legs.

The project is funded through the National Science Foundation Computer, Information Science and Engineering Directorate and includes researchers and students from Rochester Institute of Technology, Georgia Tech, and Georgetown University.

"The data collected through this project will assist designers and engineers in developing more sophisticated assistive aids for individuals suffering from various neuromuscular diseases and musculoskeletal injuries," explains Edward Brown, assistant professor of electrical engineering at RIT and director of the Biomechatronics Learning Laboratory."

Brown adds that people with these types of ailments, such as muscular dystrophy, have extremely weak muscles that waste away over time. These individuals experience difficulties in the simplest of physical tasks, for example, picking up a cup or holding a spoon. A robotic

orthosis that takes advantage of the individual's residual strength and any remaining physiological information in their limbs, such as an electromyographic signal produced in muscles, could ultimately assist muscular dystrophy patients regain significant use of there limbs.

"Better orthotic technologies could ultimately help people suffering from this disease greatly enhance the quality of their life," Brown says.

Researchers in the Biomechatronic Learning Laboratory are currently studying individuals with healthy muscles to develop a baseline, and then plan to test their robotic system on patients currently suffering from muscular dystrophy. The results from the project will be used to enhance the development of orthotics technologies and also contribute to the broader field of rehabilitation robotics, including the creation of better prosthetic limbs.

Source: Rochester Institute of Technology