Exoskeleton for Rehabilitation

A NEW CO-DEVELOPMENT OPPORTUNITY

Reference No: NNJ16ZBH019O

Potential Commercial Applications: Department of Defense (DoD), medical rehabilitation

Keywords: exoskeleton, rehabilitation, wearable robotics, biofeedback, sensing, control monitoring

Purpose:
NASA JSC seeks parties interested in co-developing technology associated with its X1 Exoskeleton to enhance coordinated control as it applies to neuromusculoskeletal rehabilitation, increase sensing capability, and potentially include additional powered degrees of freedom.

NASA JSC is the leader in space-based humanoid robots, and has leveraged this technology to develop and advance other robotic devices. NASA JSC seeks to advance the state-of-the-art of its current X1 Exoskeleton for Rehabilitation.

By co-developing this dual-use technology, NASA JSC and interested parties may be able to extend and enhance the current capabilities in the areas of overall power, range of motion, controls, biofeedback, and safety. These advancements would thereby create a more advanced wearable robotic device with the ability to mitigate muscle atrophy in space, as well as strengthen and retrain muscle function for persons suffering from paresis and other motor function pathologies.

Technology:
NASA JSC's goal is to improve the current exoskeleton design to create a fully customizable device whose dual-use technology will improve life on Earth as well as help maintain astronaut health.

R&D Status:
NASA JSC's current X1 Exoskeleton was initially designed as a mobility assist device for persons with lower extremity paralysis. It has since shown great promise as a novel and compact in-space countermeasure and dynamometry device. The ten-degree of freedom wearable robotic device has the ability to impart high torques at its active joints while providing real-time joint feedback to physicians and scientists. X1's adaptable control software makes custom exercise and rehabilitation routines easy to realize.

Intellectual Property (IP):
Multiple individual technologies associated with robotics are currently available for co-development and licensing. Visit Robonaut 2 and click on Licensing Opportunities.

This co-development project may produce new IP that could be jointly owned by NASA and the partner or may become the property of the partner.