

## **Gravity Offload for Patient Rehabilitation**

A NEW CO-DEVELOPMENT OPPORTUNITY

**Reference No:** NNJ16ZBH0200

**Potential Commercial Applications:** medical rehabilitation, neuromuscular, proprioceptive retraining and others

**Keywords:** rehabilitation, harness design, controls monitoring, gravity offload, control monitoring

### **Purpose:**

NASA JSC seeks parties interested in co-developing technology associated with its Active Response Gravity Offload System (ARGOS).

The ARGOS allows humans, robotics, and passive systems to experience reduced gravity environments from microgravity to full gravity (e.g., earth surface, lunar surface, Martian surface and microgravity).

The medical community has noted that application of such a system would greatly improve the state-of-the-art for medical rehabilitation for conditions including lower extremity rehabilitation, neuromuscular and proprioceptive retraining. ARGOS is more sensitive to subtle motions than any system currently available.

### **Technology:**

ARGOS supplies continuous ability to offload a portion or all of a person's weight during dynamic motions such as walking, running, and jumping. The ARGOS system tracks the person's motion in the horizontal direction to maintain a vertical offload force directly above the person by measuring the deflection of the cable and adjusting accordingly.

ARGOS accomplishes this feat using a full motion based robotic system. This system, while similar to an under-hung gantry crane system, reacts to the motion of the mass instead of a manually operated controller.

NASA designed this facility to be capable of accomplishing the following: surface operation studies; space suit and space vehicle requirements development; space suit and space vehicle design evaluation; and testing of rovers and robots in simulated reduced gravity environments.

For more information please visit the ARGOS [website](#).

### **R&D Status:**

The ARGOS utilizes advanced hardware and software technology that continues to be developed and updated.

Challenges to adapting the ARGOS for patient rehabilitation include harness comfort and reduction of human performance caused by a harness system.

**Intellectual Property:**

US Patent No.: US 9,194,977 B1 – Active Response Gravity Offload System and Method.

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.