# AN ACTIVE JOINT FOR REHABILITATION DEVICES

*This technology describes a "self-adjusting exoskeleton joint" for robot-assisted treatment of neurological injuries and rehabilitation". This technology offers an effective, ergonomic and cost effcient treatment method, enabling complex joint movement accommodation, high rotational torque, coupled to a compact design for physical rehabilitation therapies.*

## Potential Applications

This technology is applicable in the healthcare organizations for the use of physical therapy for complex human joints such as shoulder and pelvis-hip joint complex.

## Customer Benefits

- Perfect match between the human joint axis and the device axis guaranteeing ergonomy and comfort for the patient
- Adjustability feature significantly shortens the setup time for attaching the patient to the robot
- Extended comfortable range of motion for the joints
- Ability to deliver therapies that cannot be delivered by other robotic devices

## Technology Features & Specifications

This novel "device for robot-assisted rehabilitation" offers an effective, ergonomic and thus cost efficient treatment by means of complex joint movement accommodation, high rotational torque and compact design for physical therapies.

The novelty that is brought by this technology originates from its "kinematic structure/design" that allows both translational movements of the joint along with the rotational movements.

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**Market Trends and Opportunities**

According to WHO statistics, neurological injuries are the leading cause of serious, long-term disability in developed countries and each year over 15 million people suffer from long term neurological injuries, such as stroke. In US, the estimated average direct cost of stroke per patient during the first 3 months of treatment is about 15 thousand dollars, while for over 10% of cases, the cost increase up to 35 thousand dollars or higer.

Physical therapy is an indispensable element for the treatment. Use of robotic devices in assistance of repetitive and physically involved rehabilitation exercises significantly reduces the application related costs. Moreover, robot-mediated rehabilitation therapy allows quantization of patient progress, guarantess, patient safety, and increase accuracy of tasks with high repetitions, and can be utilized to realize customized, interactive treatment protocols.

The adjustability feature of our design significantly shortens the setup time required to attach the patient to the exoskeleton while other existing designs typically spend 15-20 minutes of therapy time for these adjusments.