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Soft Elbow Exosuit to Supplement Bicep Lifting Capacity

Workers, such as freight, stock, and warehouse personnel, perform continuous strenuous tasks such as packing, shelving, and unloading, on a daily basis. Because these tasks are both strenuous and repetitive, physical complications such as muscle fatigue, lower back injuries, and upper back injuries often develop in these workers. This results in reduced worker productivity, and can also impact quality of life. Some potential solutions for this major issue have been developed, specifically in the field of wearable robotics. Though these devices seek to increase the load bearing ability of the user, they are often too rigid, and have challenges with high development cost, portability, joint alignment, and comfort.

Researchers at Arizona State University have designed a novel soft elbow exosuit capable of providing supplemental lifting capacity. Using an array of soft actuators for bicep assistance, this device improves the efficiency and endurance of workers who are tasked with repetitive lifting. An elbow joint torque value of 27.6N.m can be achieved at 300kPa, which is comparable to the 30N.m maximum set by OSHA. This unique design allows for measurable assistance to lifting with minimal obstruction to a user's range of motion.

This lightweight and comfortable device has the potential to reduce muscle strain and injury as well as increase productivity in workers who perform repetitive lifting tasks.

Potential Applications

- Freight work
- Stock work
- Warehouse work
- Other strenuous upper body work

Benefits and Advantages

- High force to weight ratios to provide maximum assistance – can lift heavy

loads

- Portability
- Comfortable – soft not rigid materials
- Low development cost
- Better alignment with joints
- Comfortable

For more information about this opportunity, please see

[Lab Presentation](#)

For more information about the inventor(s) and their research, please see

[Dr. Polygerino's laboratory webpage](#)