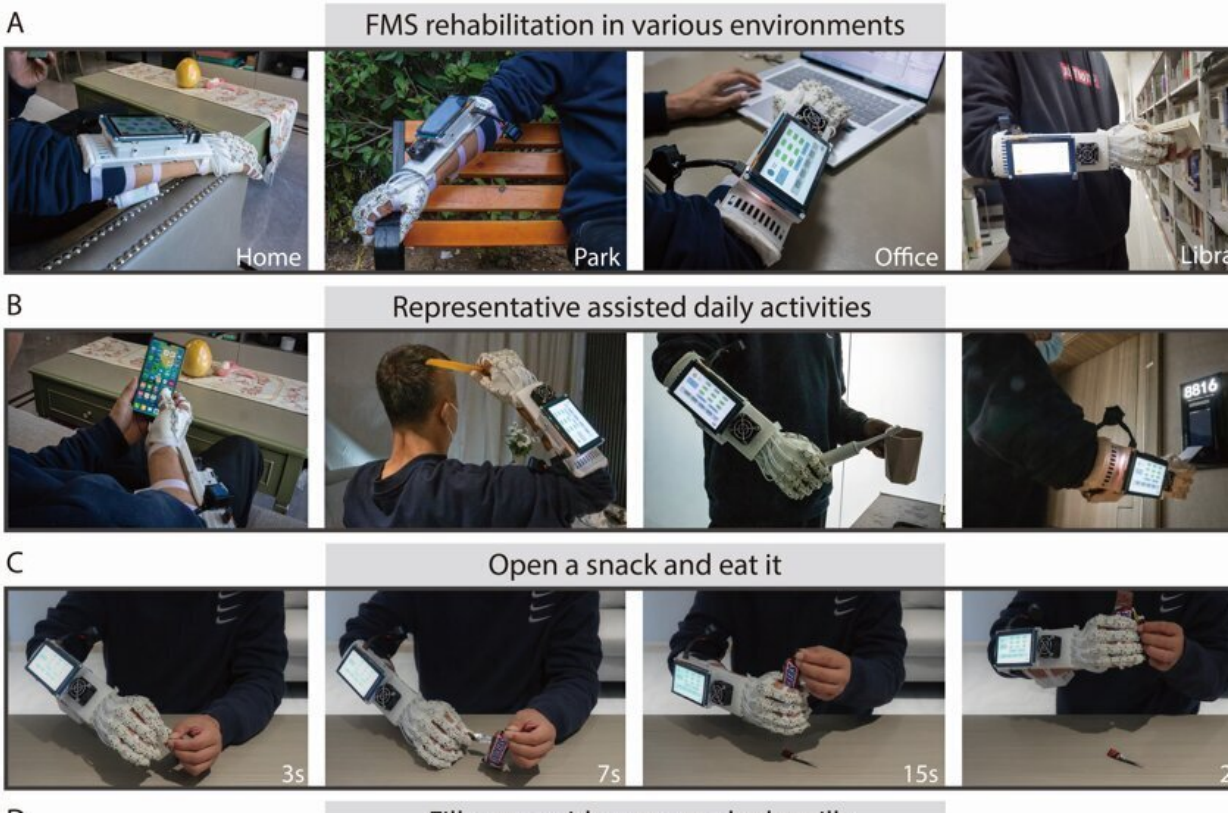


Researchers develop soft-packaged, portable rehabilitation glove

October 17 2023



Multi-scene application and life assistance function of flexible rehabilitation glove robot. Credit: USTC

Researchers from the University of Science and Technology of China (USTC) of the Chinese Academy of Sciences (CAS) have proposed a soft-packaged and portable rehabilitation glove with fine movement

training. It is expected to serve the fine motor rehabilitation and daily living assistance for tens of millions of patients with hand dysfunction around the world.

The technology was described in an article published on Oct. 5 in [*Nature Machine Intelligence*](#).

Patients with [hand](#) dysfunction can recover through repeated and continuous hand [movement](#) training. Soft-packaged rehabilitation gloves are lightweight and flexible.

However, because a flexible body is prone to large deformation, which is not conducive to [motion perception](#), and currently available gloves are not conducive to portability, most soft-packaged rehabilitation gloves can only achieve therapeutic movement based on open loop control. This makes the precise rehabilitation of fine motor skills of the hand still challenging.

In this study, the researchers designed a bionic finger sleeve structure that integrates smooth movement and accurate perception by integrating 15 bending sensors and 10 shape-memory-alloy actuators.

Due to the shape memory alloy with high work-to-weight ratio and integrated design, the flexible rehabilitation glove robot weighs only 490 grams and has the ability to work independently.

By imitating the folded skin of the back of the finger, the research team proposed a bionic design featuring a non-uniform stiffness flexible finger sleeve, which reduces the interference of finger sleeve movement on the sensing system and achieves stable and accurate finger state perception.

Further, they proposed a multi-modal fine action rehabilitation training

method to achieve portable, accurate and safe rehabilitation training for patients with hand dysfunction. Clinical trials have preliminarily verified the advantages of the portable, low-cost soft-packaged rehabilitation glove robot in fine sports [rehabilitation](#) and daily living assistance.

More information: Mengli Sui et al, A soft-packaged and portable rehabilitation glove capable of closed-loop fine motor skills, *Nature Machine Intelligence* (2023). [DOI: 10.1038/s42256-023-00728-z](https://doi.org/10.1038/s42256-023-00728-z)

Provided by Chinese Academy of Sciences

Citation: Researchers develop soft-packaged, portable rehabilitation glove (2023, October 17) retrieved 29 April 2024 from <https://techxplore.com/news/2023-10-soft-packaged-portable-glove.html>

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