

Technology Opportunity, Ref. No. UB-23/231

Intelligent and adaptable hand-training device suited for home use

This new ergonomically designed hand-training device equipped with haptic feedback capabilities allows for more natural and thus more efficient rehab training after strokes or similar neurological diseases. The inherent safety of the device and its intuitive use allow for unmonitored home training by patients.

Keywords	Neuro-rehabilitation, haptic, ergonomics, stroke, mobile
Inventors	E. A. Aksöz, N. van Damme, L. Marchal-Crespo, R. Rätz
Reference	van Damme et al.: IEEE Int. Conf. Rehabil. Robot. 2022; July 2022
Background	Several hand-training devices are known which are simple to use and portable. However, they don't offer sufficient somatosensory (haptic) feedback which is needed for effective promotion of sensorimotor recovery.
Invention	Our invention consists of a portable hand trainer based on a novel compliant shell mechanism. Most important is the flexibility/resistance distribution optimized through scientific studies and simulations. The device is safe, intuitive, and can be used for various hand sizes. We put emphasis on safety, usability and efficacy for rehabilitation by implementing an ergonomic power grasp realized with a flexible shell structure. Importantly, the device provides rich sensory feedback through haptic rendering, allowing for a variety of tasks that have proven to be efficient for neuro-rehabilitation needs. The rounded bottom of the device enables the training of pronosupination movements. The hand-trainer is per the moment complemented with a rehabilitation game, where we leverage interactive tangible game elements to provide somatosensory training and foster recovery. More gaming tasks are obviously conceivable.

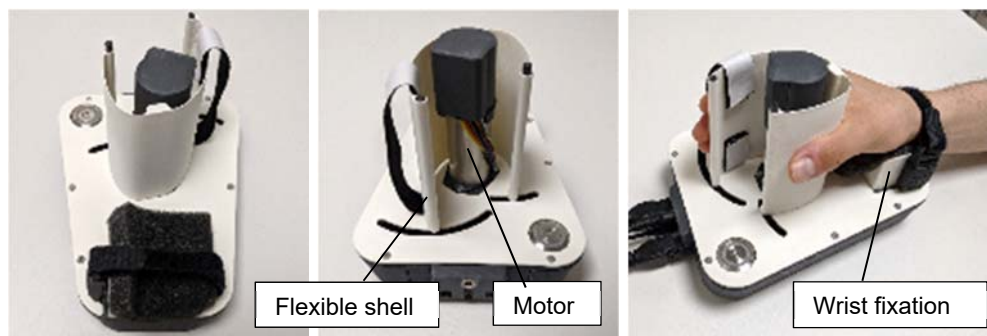


Fig: The hand-trainer with its essential features

Application	Hand training for neuro-rehabilitation patients with deficits in sensorimotor functionality, also suited for unmonitored home use.
Patent Status	Priority Patent Application filed

Contact *Unitecra, Technology Transfer University Bern, Dr. Martin Binggeli,
Hochschulstrasse 6, CH-3012 Bern, +41 (0)31 681 3231, mail@unitecra.ch*