

Robotic Rehabilitation through Observational Learning and Mixed Reality

The main objective of the project is the development a novel wearable Mixed-Reality (MR) clinical rehabilitation robotic system to assist in the training of people with limited limb mobility, such as patients with neurological disorders. The proposed new technology will focus on exploiting the visual action-execution effect for improving the training in a controlled environment. The development of the rehabilitation system will allow the use of observational and physical practice training protocols based on motor learning theory to train patients by mirroring motion of the complete onto the impaired limb and then reducing the mirror effect over training intervals.

The development of the rehabilitation MR robotic device will require testing under control conditions with healthy subjects and then transferring the developed protocols to patients with neurological disorders. A comparison between observational training and physical practice therapy will demonstrate if the developed system is allowing for observational learning of motor skills and imitation of motor skills to occur. This will further our understanding of how training using technology may enhance the recovery of motor control in diverse populations, while providing a novel intervention that may prove more effective than what is currently available.