

Game-Based Rehabilitation Lab

Effective and Engaging Rehabilitation Applications Using Video-Game Technologies

2010-present

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ICT's Game Based Rehabilitation Lab develops, tests and deploys clinically validated, interactive tools for rehabilitation, with the purpose of improving quality of care and quality of life. Systems are designed for clients recovering from trauma, such as stroke, mild traumatic brain injury and spinal cord injury; and for high-risk groups, including elderly adults at risk for falls and athletes and soldiers at risk of concussive head injuries.

Therapy after an injury or illness can be painstaking, slow and tedious for both the client and the therapist. For many, the amount of time spent one-on-one in a clinic or hospital is far subpar to true theory- or evidence-driven rehabilitation. Many clients are forced to pay out-of-pocket for services and rely on self-directed programs at home or in the community. Further, therapists are unable to track and quantify performance in the clinic and outside of regular therapy hours. Overall, engagement and enjoyment tend to be low.

The lab addresses these gaps by offering solutions in the form of engaging, motivating, digitally-driven tasks that are safe and appropriate for rehabilitation. Systems pair customized software with low-cost, commercially-available devices, like the Oculus Rift, Microsoft Kinect and Nintendo Wii Fit. Therapists can individualize exercises based on clients' abilities and needs. Sensors collect data and provide feedback on performance to the therapist and the client as appropriate. Utilizing a user-centered design process, clients and therapists are active team members in driving development and testing in environments including individual homes, inpatient rehabilitation facilities, day treatment programs, outpatient clinics and military brain injury clinics.

Current systems, and associated peripherals, include:

- Mystic Isle (Microsoft Kinect and Kinect2, Oculus Rift)
- Mystic Isle for TBI (Microsoft Kinect and Kinect 2)
- Star Catch (Wii Fit Balance Board)
- Crazy Kitchen (Microsoft Kinect- tracking hands only)

At the University of Southern California Institute for Creative Technologies leaders in artificial intelligence, graphics, virtual reality and narrative advance low-cost immersive techniques and technologies to solve problems facing service members, students and society.

