Immersive Virtual Reality for Eye-Hand Coordination Assessment in Children with Hemiplegia

Principal Investigator:

Danielle Levac, PT, PhD
Northeastern University
Boston, MA

Co-Investigator:

Alexa K. Craig, MD, MS
Tufts University School of Medicine

Overview
This study will investigate the use of a low-cost immersive virtual reality (VR) headset and tracker in evaluating eye-hand coordination in children with hemiplegia. Investigators plan to develop and design various eye-hand coordination tasks using computer-based and VR conditions. Researchers will compare how the children's performance of eye-hand coordination tasks differs between pencil and paper, computer-based and VR assessments and if this type of tool can be safely used by children with varying abilities and ages. Results from this study may provide a novel method for clinicians to assess eye-hand coordination within more realistic task conditions for children with hemiplegia.

Abstract
Many children with CP find it difficult to coordinate eye and hand movements, making participating in everyday activities challenging. Current assessment methods are limited in that they do not evaluate eye-hand coordination impairments under realistic conditions.

Study investigators plan to use a low-cost virtual reality (VR) headset and trackers that measure eye and hand movement to assess eye-hand coordination in more realistic virtual environments. Various eye-hand coordination tasks will be designed using different computer-based and VR conditions. The children will be recruited from three hospital sites and will be assessed while they are waiting for their CP or stroke clinic appointment.

The investigators will examine whether children of different ages and abilities can safely complete immersive VR tasks, how the children's performance of eye-hand coordination tasks differs between pencil and paper, computer-based and VR assessments, and how eye-hand coordination is impacted by more complex VR environments. This pilot study may provide a new accessible testing method that can be used by clinicians on a wider scale and create new knowledge about how eye-hand coordination impairments impacts function. Results may also provide evidence on how VR performance is similar to real-life performance, and provide a new testing treatment of eye-hand coordination using VR for children with hemiplegia.

For more information visit:

Dr. Levac: www.northeastern.edu/regamevrlab
Dr. Craig: https://mmcri.org/?page_id=7973