Mariusz Furmanek, PhD, PT, DPT is an Assistant Professor in the Physical Therapy Department at the University of Rhode Island. He graduated from the Academy of Physical Education in Katowice, Poland, in Physical Therapy, Physical Education, and Kinesiology. He is a PI of the Motor Control and Rehabilitation Lab (MCR-Lab). Dr. Furmanek completed Postdoctoral Fellowship in the Movement Neuroscience Laboratory, Department of Physical Therapy Movement and Rehabilitation Sciences at Northeastern University in Boston, where he received his DPT. He has clinical experience in outpatient orthopedics and neurorehabilitation. Dr. Furmanek's research and academic focus are on Motor Control and Neuroscience in rehabilitation, athletic training, and virtual engagement.

Abstract: Rarely do we appreciate the ease at which we can reach and grasp a glass of water unless control becomes impaired by injury. Achieving this degree of control requires deft and rapid online feedback (via visual and somatosensory systems) that can update ongoing actions. Sensory updating is impaired in a number of pathologies, making it crucial to understand this behavior in healthy individuals. However, studying these mechanisms in the upper limb, especially the hand, has been challenging the reach-to-grasp behavior is still not adequately characterized, and second, invoking perturbations to the reach-to-grasp action is difficult. I will present work completed during my post-doctoral training which aimed to understand human reach-to-grasp coordination. I will demonstrate a novel approach for parsing the reach-to-grasp movement into three phases: initiation, shaping, closure based on established kinematic variables, performed both in physical and virtual environments. Furthermore, I will present recent work examining the role of key brain regions (using transcranial magnetic stimulation to temporarily perturb cortical circuits) in visual and proprioceptive updating of reach-to-grasp coordination. I will conclude by describing how my approach may be used to bridge research findings to practical applications and potential future directions.

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