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Introduction: Neurological conditions such as Parkinson's Disease (PD) cause changes in the subcortical and cortical structures of the brain, affecting interactions between the dorsal and ventral visual streams. The dorsal stream processes the location of objects in the visual workspace while the ventral stream identifies those objects. We expect that, in individuals with PD, motor deficits will occur as a result of disruptions in online interactions between the dorsal and ventral streams.

Purpose: In the experiment, participants identify object shape while shapes are either moving or stationary, and make accurate reaching movements to the objects. Our hypothesis is that deficits in online interactions between the two visual streams in PD patients will contribute to slower processing of somatosensory feedback during reaching movements.

Methods: A behavioral experimental paradigm was developed on a KINARM robot integrated with eye-tracking and virtual-reality. During each trial, one circular or elliptical target appears in the visual workspace. Participants are asked to make a rapid reaching movement toward circular targets, avoiding elliptical targets. A green (correct) or red (incorrect) circle is shown following each trial, indicating whether the participant correctly hit or avoided the target. Hand kinematics are recorded as participants perform reaching movements, allowing us to record temporal and spatial behavioral characteristics.

Results: A pilot exam (300 trials) with a healthy participant showed an average peak hand velocity of 93.01 m/s in the dynamic horizontal condition, 68.72 m/s in the static condition. The rate of correct target hits was 26% in the horizontal condition and 30.67% in the static condition. This paradigm will contribute to our understanding of visuomotor neural networks interact during planning and execution of fast movements and how these interactions are disrupted during PD.

Future work: We will present on four young and four older controls.