Ride Motion Effects on the Accuracy of Rapid Pointing Tasks

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Reaching movements are planned and subsequently executed [1] using visual and somato-sensory feedbacks [2], where absence of visual feedback is known to increase endpoint variability [3]. Visual occlusion decreases the ability to make rapid online compensatory movements, which results in initial radial deviations that are highly correlated with radial dispersion at the target. Perturbations of rapid, visually-guided reaches are compensated on-line and result in endpoint dispersions poorly correlated with initial deviations, emphasizing the strong effect of visual feedback in temporally-constrained reaching tasks. In control conditions (no vibration), these uncompensated, rapid reaches serve as estimates of the individual’s intended trajectory. When ride motion is present, trajectories of rapid, visually-occluded reaches provide a measure of the natural biodynamic response of the cantilevered spine-arm-hand linkage. These intended movement trajectories and the biodynamic response (vibration feed-through) are used to predict the effect of ride motion on the performance of rapid reaching tasks. Goals of this study are to investigate the influences of vehicle motion on human reaching and pointing, and to reveal movement strategies used in visually-occluded reaching tasks.

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