

CLOSED-LOOP VR-BASED INTERVENTION TO IMPROVE WALKING IN PARKINSON'S DISEASE

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A closed-loop virtual visual cueing system was used to probe the automatic locomotor structures in subjects with idiopathic moderate to severe Parkinson's disease. The cues were synchronized to the speed of each subject's walking but in the opposite direction, thereby giving rise to the perception of walking across a stationary landscape. In the absence of explicit instructions and practice, the virtual visual cues induced spontaneous changes among various walking kinematics. An increase in cadence was found which was strongly associated with a corresponding decrease in step length and walking speed. These novel findings suggest that the automatic control of cadence is relatively intact in individuals with moderate to severe stages of the disease and amenable to close-loop visual cues. Step length and walking speed on the other hand, require cognitive or attention strategies for normalization.