
Sonifying Handwriting Movements for the Diagnosis of Parkinson's Disease

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Résumé

The diagnosis of Parkinson's disease (PD) is based on the clinical-motor assessment of the TRAP acronym syndromes (Tremor at rest, Rigidity, Akinesia and Postural instability), via the Unified Parkinson's Disease Rating Scale. Recently, novel tasks and tools were proposed to identify new biomarkers for the early diagnosis and the follow up of PD. Among them, thanks to the development of new technologies, handwriting or related graphic tasks seem to become particularly relevant. The present project aims at 1- detecting specific variables on handwriting movements which evolve with the disease and 2- transforming these variables into sounds to render them perceptible. Sixteen patients with idiopathic PD were required to write words and to draw several spirals on a graphic tablet under the 'on' and 'off' L-dopa medication. Preliminary results on spiral drawing revealed that the movement fluency and velocity, the number and the cumulative duration of movement stops, as well as the axial pen pressure exerted on the tablet were significantly different with and without L-dopa. We think that transforming these variables into sounds may allow the neurologists to reach supplementary objective criteria "by ear" and thus, to help them to evaluate PD patients.

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