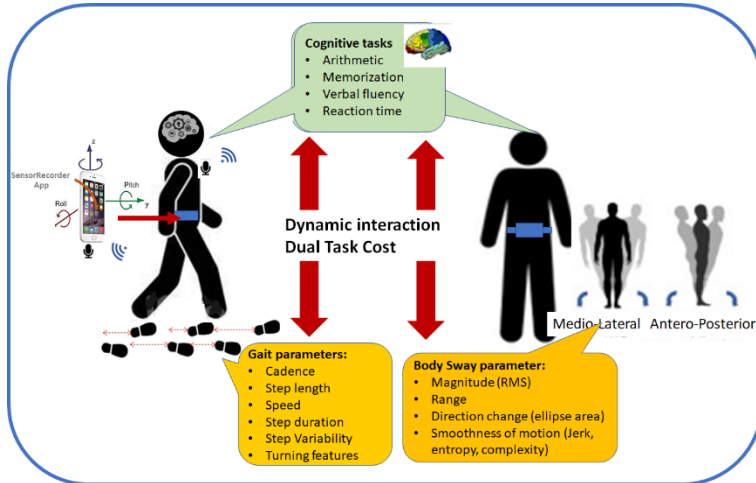


Toolbox for instrumented dual motor-cognitive tasks assessment using multimodal data recorded with iPhone



Measurement protocol and estimated parameters related to motor and cognitive tasks

Ref. Nr

6.2406

Keywords

dual motor-cognitive task, gait, balance, speech to text, verbal fluency, memorisation, arithmetic, clinical assessment

Intellectual Property

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Description

This toolbox includes algorithms to detect and characterize motor activity (gait parameters, body sway and balance, turning) while performing concurrently various cognitive tasks. The toolbox includes also algorithms to quantify the cognitive tasks, designed to be expressed vocally and to be analyzed using voice recording and speech to text processing. The speech processing algorithms are tuned for four languages (English, French, Italian and German). The motor-cognition interaction is quantified using clinically validated metrics (dual-task cost).

Advantages

- Fully instrumented test (recording and processing synchronous data recorded with sensors integrated in iPhone)
- Includes a set of cognitive tasks to allow selection according to the clinical interest (memory, verbal fluency, ability to perform arithmetic tasks, reaction time and decision making)
- Similarly, the motor task(s) can be selected according to clinical need (e.g., gait, static balance, turning ability during walking task)

Applications

- Clinical assessment of cognitive decline (aging, neurodegenerative diseases)
- Balance and cognitive assessment after head impact and concussion in sports (e.g., hockey, American football, baseball)
- Rehabilitation (in-clinic and/or at home) and assessment using multimodal motor-cognition programs (e.g., in post-stroke, elderly, Parkinson's disease)

