Wearable Technologies for Assessment of Movement Disorder

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Research Description

- Quality of life is influenced by an individual's ability to remain functionally independent.
- A variety of movement disorders (e.g., Parkinson's Disease, gait disorder, etc.) affect mobility and by extension, independence.
- We believe that an information-centric, proactive approach to healthcare will facilitate research and better treatment of movement disorders, prolonging independence and improving quality of life in our aged population.
- Currently, there exists no technology infrastructure to clinically study movement continuously, quantitatively, naturalistically, non-invasively, flexibly, and inexpensively.

- Our team has developed TEMPO, an end-to-end solution for objective assessment of movement disorder that addresses these deficiencies and allows physicians and medical researchers to 1) non-invasively record accurate, precise, quantitative human motion data via wearable wireless inertial sensors, and 2) process the data with sophisticated signal processing algorithms to reveal useful information not obvious or not accurately described by visual observation and self-report alone.
- Our technology is currently deployed in three pilot studies with the University of Virginia and Carilion Health Systems.

- Continuous, natural, inexpensive gait characterization enables improved fall risk assessment, including the detection of transient, abnormal gait events, which can motivate a therapeutic intervention for fall prevention.
- Objective tremor measurement and classification, which has revealed elusive measures such as axial and ipsilateral benefit that facilitate the study of tremor presentation, treatment, and etiology.
- Monitoring agitation/akathisia in neuroleptic pharmacotherapy patients enables improved therapeutic intervention.
- TEMPO creates new opportunities for movement disorder research, including prevention, diagnosis, and therapy.

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