

Special Issue on

Advances in Nonlinear Time-Series Analyses for the Prognosis, Treatment, and Modeling of Movement Disorders

CALL FOR PAPERS

Over the last two decades, nonlinear tools such as fractal analyses and entropy measures have been used to describe the time-series dynamics of motor output—for example, in the control of posture, locomotion, and daily ambulatory activity—and have revealed differences in the motor-output structure of healthy individuals and those with movement disorders. The *optimal variability* of healthy individuals appears to reflect a balance between too much rigidity (i.e., periodicity without cycle-to-cycle fluctuations) and too much irregularity (i.e., random cycle-to-cycle fluctuations) in the control of motor output.

Despite a wealth of studies showing differences between the structure of motor output in the able-bodied and those with movement disorders, there is currently no single explanation accounting for those differences. However, there have been some attempts to simulate the time-series structure of motor output in health and disease; such attempts have included, for example, use of biomechanical models, Super Central Pattern Generators (SCPGs), and models based on the notion of degeneracy.

Understanding differences in the mechanisms of, and developing models that distinguish between, the time-series structure of healthy individuals and those with movement disorders may be crucial for the improvement and prevention of movement disorders and the advancement of movement-disorder treatment.

We invite investigators from different disciplines—for example, kinesiology, biomechanics, biomedical engineering, physiology, psychology, mathematics, and statistics—to contribute reviews as well as original research articles.

Potential topics include but are not limited to the following:

- ▶ Modeling conditions for disease-to-health change in motor-output structure
- ▶ Refinement of existing nonlinear methods for detection of movement disorders
- ▶ Development of novel nonlinear methods for the detection of movement disorders
- ▶ Comparisons of different nonlinear methods for discriminating healthy and pathological motor-output processes
- ▶ Prognosis of movement disorders using nonlinear analyses
- ▶ Nonlinear analyses that describe the coordination between different systems (e.g., locomotor-respiratory, cortical-behavioral)

Authors can submit their manuscripts through the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/cmmm/anta/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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