



Nonlinear Analysis for Human Movement Variability

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Nonlinear Analysis for Human Movement Variability From CRC Press

How Does the Body's Motor Control System Deal with Repetition?

While the presence of nonlinear dynamics can be explained and understood, it is difficult to be measured. A study of human movement variability with a focus on nonlinear dynamics, **Nonlinear Analysis for Human Movement Variability**, examines the characteristics of human movement within this framework, explores human movement in repetition, and explains how and why we analyze human movement data. It takes an in-depth look into the nonlinear dynamics of systems within and around us, investigates the temporal structure of variability, and discusses the properties of chaos and fractals as they relate to human movement.

Providing a foundation for the use of nonlinear analysis and the study of movement variability in practice, the book describes the nonlinear dynamical features found in complex biological and physical systems, and introduces key concepts that help determine and identify patterns within the fluctuations of data that are repeated over time. It presents commonly used methods and novel approaches to movement analysis that reveal intriguing properties of the motor control system and introduce new ways of thinking about variability, adaptability, health, and motor learning.

In addition, this text:

- Demonstrates how nonlinear measures can be used in a variety of different tasks and populations
- Presents a wide variety of nonlinear tools such as the Lyapunov exponent, surrogation, entropy, and fractal analysis
- Includes examples from research on how nonlinear analysis can be used to understand real-world applications
- Provides numerous case studies in postural control, gait, motor control, and motor development

Nonlinear Analysis for Human Movement Variability advances the field of human movement variability research by dissecting human movement and

studying the role of movement variability. The book proposes new ways to use nonlinear analysis and investigate the temporal structure of variability, and enables engineers, movement scientists, clinicians, and those in related disciplines to effectively apply nonlinear analysis in practice.

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Nonlinear Analysis for Human Movement Variability From CRC Press Bibliography

- Sales Rank: #1543912 in Books
- Published on: 2016-01-26
- Original language: English
- Number of items: 1
- Dimensions: 9.20" h x 1.10" w x 6.20" l, .0 pounds
- Binding: Hardcover

• 408 pages

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Editorial Review

Review

"This is an excellent book not only for those interested in human movements but for those interested in nonlinear phenomena more generally."-Nonlinear Dynamics, Psychology, and Life Sciences Journal, October, 2016

"In summary, *Nonlinear analysis of human movement variability* is a welcome addition for students and researchers of human movement science who are sure to appreciate a new introduction and reference work to this intriguing and important emerging research area"- Journal of Biomechanics, September 2016.

About the Author

Dr. Nick Stergiou is the Distinguished Community Research Chair in Biomechanics, Professor, and Director of the Biomechanics Research Building at the University of Nebraska Omaha. He is also a Professor in the Department of Environmental, Agricultural, and Occupational Health of the College of Public Health at the University of Nebraska Medical Center. His research focuses on understanding variability inherent in human movement, and he recently founded the first ever Center for Research in Human Movement Variability within the Department of Biomechanics at the University of Nebraska Omaha. Dr. Stergiou is an international authority in the study of nonlinear dynamics and has published more than 200 peer-reviewed articles.

Users Review

From reader reviews:

Howard Depriest:

A lot of people always spent their very own free time to vacation or go to the outside with them family or their friend. Were you aware? Many a lot of people spent they free time just watching TV, as well as playing video games all day long. If you wish to try to find a new activity this is look different you can read the book. It is really fun in your case. If you enjoy the book that you read you can spent all day every day to reading a publication. The book Nonlinear Analysis for Human Movement Variability it is extremely good to read. There are a lot of folks that recommended this book. We were holding enjoying reading this book. In case you did not have enough space to bring this book you can buy the e-book. You can m0ore effortlessly to read this book out of your smart phone. The price is not very costly but this book possesses high quality.

Beverly Sands:

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