Applied Nonlinear Dynamics and Vibrations
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Editorial

Applied Nonlinear Dynamics and Control

Xingjian Jing

Department of Mechanical Engineering, City University of Hong Kong, Hong Kong; xingjing@cityu.edu.hk

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1. Introduction

Nonlinear phenomena pervade a vast array of engineering disciplines, historically perceived as disruptive or undesirable elements within the realm of dynamical systems. This perception has long driven a methodological inclination toward avoidance, mitigation, or suppression—manifested through decades of innovation in control theory and signal processing aimed at linearization, compensation, and stabilization across both temporal and spectral domains.

Yet, contemporary research in nonlinear dynamics is unveiling a transformative narrative: nonlinear behaviors, once sidelined, are now recognized for their remarkable potential to enhance engineering solutions. From vibration mitigation and energy harvesting to structural health monitoring and micro/nano-electro-mechanical systems, nonlinear effects are proving to be not only beneficial but often superior to their linear counterparts. Pioneering researchers are even embracing strong nonlinearities by design, unlocking functionalities and efficiencies unattainable through conventional linear frameworks.

This evolution marks a profound paradigm shift—from a reactive stance of troubleshooting to a proactive ethos of harnessing nonlinear phenomena as a source of innovation. The study of nonlinearity is thus emerging as a vibrant frontier, reshaping the landscape of engineering applications across diverse sectors.

This journal is dedicated to advancing and disseminating original research at the confluence of applied nonlinear dynamics, control theory, and emerging technologies. By spotlighting the transformative impact of nonlinear methodologies on engineering practice and innovation, we aim to catalyze a renaissance in the field—one driven by integration, exploration, and technological synergy.

Recent literature reflects this momentum, particularly in the domain of vibration control and energy harvesting. Innovative mechanisms such as the classical three-spring system, origami-inspired structures, magnetically actuated designs, bio-inspired mechanisms, and the well-established X-structure/mechanism method exemplify the diversity of nonlinear strategies being explored [1–10]. Beyond these applications, nonlinear dynamics are increasingly leveraged in fault diagnosis, robotic systems, and a multitude of other engineering contexts. These advancements, amplified by the rise of digital technologies and artificial intelligence, herald a promising and fertile future for applied nonlinear dynamics and control.

2. Aim and Scope

Applied Nonlinear Dynamics and Vibrations (ANDV) is a multidisciplinary scholarly journal encompassing the domains of Mechanical, Aerospace, Civil, Automotive, and Control Engineering, among others. Its mission is to disseminate high-caliber scientific contributions that advance the understanding and application of nonlinear dynamics and vibration phenomena within engineering contexts.

The journal prioritizes original research that demonstrates a clear and substantive advancement over existing methodologies and results, thereby contributing meaningfully to the body of engineering knowledge. Particular emphasis is placed on studies that integrate both theoretical and experimental approaches, especially those that investigate the modeling, identification, analysis, and design of nonlinear dynamical and vibrational systems.

ANDV seeks to serve as a platform for innovative research that bridges fundamental theory with practical engineering applications, fostering developments that have the potential to reshape conventional paradigms and inspire technological innovation across a broad spectrum of engineering disciplines.

The scope of *ANDV* includes but not limited to:

- Computational methods for nonlinear dynamics
- Nonlinear phenomena in engineering systems
- Nonlinear system modelling
- Nonlinear system identification
- Nonlinear vibrations (and energy harvesting)
- Non-stationary and random vibrations
- Control of vibrations and noise
- Material or structural nonlinear dynamics
- Nonlinear control systems
- Nonlinear signal processing
- Metamaterials, Meta-structures, or Meta-mechanisms
- Bio-inspired nonlinear systems and designs
- Design and application of nonlinear dynamics or vibration
- Nonlinear dynamics in fault diagnosis

3. Outlook

Applied Nonlinear Dynamics and Vibrations (ANDV) distinguishes itself from conventional journals in mechanics and nonlinear dynamics by emphasizing interdisciplinary and application-driven research that bridges theoretical foundations with emerging innovations across diverse domains. These include, but are not limited to, mechanical, electrical, electronic, aerospace, civil, automotive, control, biological, and multifunctional systems.

The journal places particular importance on studies that integrate theoretical modeling with practical engineering implementations, reflecting the dynamic evolution of applied nonlinear dynamics into novel and impactful frontiers. By fostering research that couples analytical rigor with real-world relevance, *ANDV* aims to serve as a premier platform for advancing the field and illuminating its transformative potential.

ANDV aspires to become a leading venue for pioneering nonlinear dynamics research and its enabling applications, acting as a critical conduit between foundational scientific inquiry and the development of next-generation technologies that address complex challenges in contemporary engineering practice.

Conflicts of Interest

The author declares no conflict of interest.

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