Preface

Dynamics, vibrations, and control of dynamical systems with discontinuity, stochasticity, and time delay are presented in this book. Dynamical systems with discontinuity, stochasticity, and time delay exist extensively in practical systems. This book provides the reader with a better understanding of control of dynamical behaviors of complex dynamical systems. Recent developments in dynamical systems with discontinuity, stochasticity, and time delay are discussed along with topics normally associated with discontinuous systems including but not limited to impact systems, friction-induced systems, and impulsive systems. Also presented are classic vibration and control of dynamical systems.

This content presented is based on the Second Conference on Dynamics, Vibration and Control, held in Chengdu-Jiuzhaigou, Sichuan, China, 2009 (DVC2009). The goal of this conference is to provide a place to exchange recent developments, discoveries, and progresses on dynamics, vibration, and control. This second conference is the continuation of the 2007 Arctic Summer Conference on Dynamics, Vibrations and Control. Papers and presentations relative to all areas pertaining to theoretical, symbolic, computational, and experimental aspects of dynamics, vibrations, and control were solicited. There were 57 papers initially submitted for presentation and publications. After peer review, only 34 papers were selected for publication in this book; these contributions are divided into four groups:

- **Group 1** discusses *nonlinear and discontinuous dynamical systems* and includes 11 contributions that cover fractional dynamics, chaos and bifurcations in nonlinear dynamical systems, discontinuous dynamical systems, and applications in manufacturing and rotor dynamics.
- **Group 2** discusses time-delay systems and includes four contributions that cover the method of time-continuous approximation and time-delay systems, the time-delay control for nonlinear dynamical systems, bifurcation and stability for neuronal systems with time delay.
- **Group 3** discusses switching and stochastic systems and includes six contributions that cover nonlinear dynamics of switching and impulsive dynamical systems, neuron synchronization under noise excitation, nonequilibrium transition, and stochastic resonance.
Group 4 discusses classic vibration and control with 13 contributions that cover structural dynamics, wave propagation in soil and foundations, fluid-induced vibration and control systems, and system identification.

The conference organizers would like to take this opportunity to thank all volunteers for conference preparation and hotel arrangement. We would also like to express appreciation to Ms. Yi Sun who made all the necessary arrangements for the conference and special events in China.

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