



PREFACE: CONTROL, SYSTEMS THEORY AND RELATED TOPICS

ONESIMO HERNANDEZ-LERMA AND ALEXANDER J. ZASLAVSKI

This special issue on Control, Systems Theory and Related Topics is dedicated to the memory of Professor Wendell H. Fleming.

Wendell Helms Fleming (1928 – 2023) was an outstanding American mathematician who has made fundamental contributions to the fields of geometrical analysis and stochastic differential equations. He received in 1951 his PhD under Laurence Chisholm Young at the University of Wisconsin-Madison with a thesis entitled "Boundary and related notions for generalized parametric surfaces". Wendell H. Fleming was a professor at Brown University, where he retired in 2009 as professor emeritus. Professor Fleming was with Herbert Federer a pioneer of geometric measure theory. Later in his career, he worked on stochastic processes, stochastic differential equations and their applications in control theory. In 1976-1977 he was a Guggenheim Fellow. In 1982 he gave a plenary address (Optimal control of Markov Processes) at the ICM in Warsaw.

In 1987 Professor Fleming received with Federer the Leroy P. Steele Prize of the American Mathematical Society. In 1994 he won the Reid Prize from the Society for Industrial and Applied Mathematics. He was given an honorary doctorate at Purdue University in 1991. In 2006 he received the Isaacs Award. In 2012 he became a fellow of the American Mathematical Society. In May 2012 his election to membership in the United States National Academy of Sciences was announced. Professor Fleming is an author of around 150 research publications and 4 books. He has supervised 22 doctoral students.

In this special issue we present papers authored by a selected group of experts in the areas of Control and System Theory. The papers collected here have been contributed by collaborators, friends and colleagues of Professor Fleming, who were influenced by his scientific work. The special issue contains eleven papers contributed by researchers from France, Germany, Hong Kong, India, Japan, Mexico, Spain, and the USA.

These papers cover a wide spectrum of important problems and topics of current research interest, including the reproducing kernel Hilbert spaces, Kalman filtering, differential inclusion limits of stochastic approximation, drawdown constraint for long-term investments under partial information, discrete-time hybrid control models with general state and action spaces, comparison theorems of viscosity solutions for Hamilton-Jacobi equations with co-invariant derivatives of fractional orders, expectiles in risk averse stochastic programming and dynamic optimization, an Abelian theorem for a Markov decision process in a system of interacting objects with unknown random disturbance law, pairs trading under geometric Brownian motions with regime switching, the Lagrangian formulation of optimal transport

with a non-convex cost, the analyticity of the value function in optimal investment and stochastically dominant markets, multi-patch epidemic models with migration and infection-age dependent infectivity.

Therefore, we feel that this special issue will be highly important for many mathematicians, who are interested in recent developments in Control and System Theory as well as in their diverse applications.

O. HERNANDEZ-LERMA

Department of Mathematics, Cinvestav - CDMX Zacatenco, Mexico

E-mail address: `ohernand@math.cinvestav.mx`

A. J. ZASLAVSKI

Department of Mathematics, Technion–Israel Institute of Technology, Haifa, Israel

E-mail address: `ajzasl@technion.ac.il`