Lorenz

Mutational Analysis

A Joint Framework for Cauchy Problems in and Beyond Vector Spaces

Ordinary differential equations play a central role in science and have been extended to evolution equations in Banach spaces. For many applications, however, it is difficult to specify a suitable normed vector space. Shapes without a priori restrictions, for example, do not have an obvious linear structure. This book generalizes ordinary differential equations beyond the borders of vector spaces with a focus on the well-posed Cauchy problem in finite time intervals. Here are some of the examples: - Feedback evolutions of compact subsets of the Euclidean space - Birth-and-growth processes of random sets (not necessarily convex) - Semilinear evolution equations - Nonlocal parabolic differential equations - Nonlinear transport equations for Radon measures - A structured population model - Stochastic differential equations with nonlocal sample dependence and how they can be coupled in systems immediately - due to the joint framework of Mutational Analysis. Finally, the book offers new tools for modelling.

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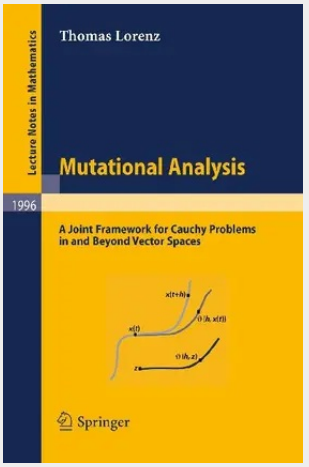

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