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## Mathematical Methods, Modelling and Applications

**Edited by: Lucas Jódar and Rafael Company**

This volume deals with novel high-quality research results of a wide class of mathematical models with applications in engineering, nature, and social sciences. Analytical and numeric, deterministic and uncertain dimensions are treated. Complex and multidisciplinary models are treated, including novel techniques of obtaining observation data and pattern recognition. Among the examples of treated problems, we encounter problems in engineering, social sciences, physics, biology, and health sciences. The novelty arises with respect to the mathematical treatment of the problem. Mathematical models are built, some of them under a deterministic approach, and other ones taking into account the uncertainty of the data, deriving random models. Several resulting mathematical representations of the models are shown as equations and systems of equations of different types: difference equations, ordinary differential equations, partial differential equations, integral equations, and algebraic equations. Across the chapters of the book, a wide class of approaches can be found to solve the displayed mathematical models, from analytical to numeric techniques, such as finite difference schemes, finite volume methods, iteration schemes, and numerical integration methods.

