



**systems**



*Special Issue Reprint*

## **Theoretical Issues on Systems Science**

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Edited by

Gianfranco Minati

Alessandro Giuliani

Andrea Roli

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In “Theoretical Issues on Systems Science”, we present theoretical issues including theoretical incompleteness, multiplicity, systems as networks and chaos, game theory, and meta-structures. Other less explored research topics include equivalence and tolerance in systems, pending systems, recurrence and self-reflexivity, remote synchronization, and the significance of using complex numbers in system models.

The first group of papers addresses theoretical aspects, including 1) the role of noise in complex systems; 2) the potential of general systems theory to serve as a theory of everything; 3) the drawbacks of applying classical axiomatic deductive mathematical approaches to topics such as control evolution by rewriting DNA “instructions”; 4) the near non-existence of purely “theory-free” approaches and the balance between theoretical and empirical contributions; 5) the neglect in reductionism in that systems acquire properties and the assumption that multiple, variable interactions of complexity can be analytically “zipped”; and 6) tree-based methods for statistical learning, for which the author presents a systems theory-based framework to speed up discrete event system stochastic simulations.

The second group of papers examines theoretical aspects within specific fields, including 1) human dynamics; 2) human cognition; 3) complex physiological processes; 4) medicine; 5) chemical organization theory; and 6) psychotherapy.



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