1. Record Nr. UNINA9910298327603321

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Titolo	Modeling Dynamic Biological Systems / / by Bruce Hannon, Matthias Ruth
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2014
ISBN	3-319-05615-8
Edizione	[2nd ed. 2014.]
Descrizione fisica	1 online resource (XVI, 434 p. 298 illus., 280 illus. in color.)
Collana	Modeling Dynamic Systems, , 2199-2606
Disciplina	570.113
Soggetti	Ecology Biomathematics Population Biochemistry Computers Ecology Mathematical and Computational Biology Population Economics Biochemistry, general Models and Principles
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	I. INTRODUCTION -- 1. Modeling Dynamic Biological Systems -- 2. Exploring Dynamic Biological Systems -- 3. Risky Population -- 4. Steady State, Oscillation and Chaos in Population Dynamics -- 5. Spatial Dynamics.- II. PHYSICAL AND BIOCHEMICAL MODELS.- 6. Law of Mass Action -- 7. Catalyzed Product -- 8. Two-Stage Nutrient Uptake -- 9. Iodine Compartment -- 10. The Brusselator -- 11. Signal Transmission -- III. Genetic Models -- 12. Mating and Mutation of Alleles -- 13. Artificial Worms -- 14. Langur Infanticide and Long-term Matriline Fitness -- IV. MODELS OF ORGANISM -- 15. Odor Sensing -- 16. Stochastic Resonance -- 17. Heart Beat -- 18. Bat Thermo-Regulation -- 19. The Optimum Plant -- 20. Soybean Plant Growth -- 21. Infectious Diseases -- VI. SINGLE POPULATION MODELS -- 22. Adaptive Population Control -- 23. Roan Herds -- 24. Population

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Community.

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Sommario/riassunto

Many biologists and ecologists have developed models that find widespread use in theoretical investigations and in applications to organism behavior, disease control, population and metapopulation theory, ecosystem dynamics, and environmental management. This book captures and extends the process of model development by concentrating on the dynamic aspects of these processes and by providing tools that virtually anyone with basic knowledge in the Life Sciences can use to develop meaningful dynamic models. Examples of the systems modeled in the book range from models of cell development, the beating heart, the growth and spread of insects, spatial competition and extinction, to the spread and control of epidemics, including the conditions for the development of chaos. Key Features · Easy-to-learn and easy-to-use software · Includes examples from many subdisciplines of biology, covering models of cells, organisms, populations, and metapopulations · No prior computer or programming experience required Key Benefits · Learn how to develop modeling skills and system thinking on your own rather than use models developed by others · Easily run models under alternative assumptions and investigate the implications of these assumptions for the dynamics of the biological system being modeled · Develop skills to assess the dynamics of biological systems.