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Titolo	Chemical Optimization Algorithm for Fuzzy Controller Design [[electronic resource] /] / by Leslie Astudillo, Patricia Melin, Oscar Castillo
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ISBN	3-319-05245-4
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (81 p.)
Collana	SpringerBriefs in Computational Intelligence, , 2625-3704
Disciplina	006.3
Soggetti	Computational intelligence Control engineering Chemistry, Physical and theoretical Robotics Automation Artificial intelligence Computational Intelligence Control and Systems Theory Theoretical and Computational Chemistry Robotics and Automation Artificial Intelligence
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Introduction -- Theory and Background -- Chemical Definitions -- The Proposed Chemical Reaction Algorithm -- Application Problems -- Simulation Results -- Conclusions.
Sommario/riassunto	In this book, a novel optimization method inspired by a paradigm from nature is introduced. The chemical reactions are used as a paradigm to propose an optimization method that simulates these natural processes. The proposed algorithm is described in detail and then a set of typical complex benchmark functions is used to evaluate the performance of the algorithm. Simulation results show that the proposed optimization algorithm can outperform other methods in a

set of benchmark functions. This chemical reaction optimization paradigm is also applied to solve the tracking problem for the dynamic model of a unicycle mobile robot by integrating a kinematic and a torque controller based on fuzzy logic theory. Computer simulations are presented confirming that this optimization paradigm is able to outperform other optimization techniques applied to this particular robot application.