

# Chemical Optimization Algorithm for Fuzzy Controller Design (SpringerBriefs in Applied Sciences and Technology)

Leslie Astudillo, Patricia Melin, Oscar Castillo



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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.

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