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# Associative Memory

A System—Theoretical Approach

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This monograph is an introduction to the mathematical theory of associative memory. It is addressed to researchers and students working in many different fields, for instance, cybernetics, computer science, biomathematics, and mathematical psychology. A considerable amount of tutorial material has been included: mathematical operations in linear vector spaces, matrix equations, principles of associative data structures, logic description of search operations, physical implementation of associative memories, and a review of the biological foundations of memory. The primary objective, however, is to familiarize the reader with various processes and transforms by which associations between patterned items can be represented and stored. This approach makes it possible to relate many abstract concepts of information processing to the theories of learning, pattern recognition, estimation theory, etc., in a fresh way. The implications of these methods to the study of biological associative memory are also considered.

**Contents:** Introduction.—Associative Search Methods. — Adaptive Formation of Optimal Associative Mappings. — On Biological Associative Memory.



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