Silviu Guiaşu

INFORMATION THEORY WITH NEW APPLICATIONS

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Mathematical theory of information, although it is a very young science, has recorded a new and strong development for which the well-known Romanian mathematician Silviu Guiaşu has greatly contributed. To this end, an eloquent proof is the present work that may be considered as a remarkable contribution of the author, both for the mathematical substantiation of information theory and an extension of application field for his most important concepts.

The first part of the work is a rigurous presentation, specific to the author, of the probabilistic foundations of information concepts and obviously of information transmission, followed by a presentation of algebraic foundations of coding the information, this being considered as a premiére in the field of research, since as we know, it is for the first time when the two categories of problems related to the information concept, appear together. A second première in this field is the problem related to the application of information theory in statistics, by a scientific presentation and analysis of the Markovian and Bayerian points of view as regards the statistic interference by taking into consideration the concept of information quantity.

After these two premières, the author further shows other applications of information theory, namely the application of its concepts for systems theory, pointing out the measuring of a random system organization as being equal to the difference between the entropy of spares and the entropy of the ensembly, being illustrated in this way the fact that if a system is better organized, the behaviour of the ensemble is better stated, in spite of non-stated behaviour of the individuals forming the system.

Then, there follows a series of considerations related to the applications of information theory in the classification theory, reconnaissance theory and decisions theory, with their applications in games theory.

The work also includes rich references very useful for those interested in other documentation sources concerning certain points of view related to the problems treated by the author.

Due to its scientific content and its way of presentation, the author shows his deep interest for his readers, and the work addresses to an important number of specialists, mathematicians, engineers, cyberneticians, which are interested in the theoretical concepts and also in the large fields of their practicability.

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