

Introduction to the General Information Theory

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There exist several common theoretical information paradigms in the Information Sciences. May be, the most popular is the approach based on the generalization of the Shannon's Information Theory [Shannon, 1949; Lu, 1999]. Another approach is the attempt to be synthesized in a common structure the existing mathematical theories, which are applicable for explanation of the information phenomena [Cooman et al, 1995]. Besides of this, we need to point the diligence of the many researchers to give formal or not formal definitions of the concept "information". At the end, there exist some works that claim for theoretical generality and aspire to be a new approach in the Information Science, but their authors should clear up what they really talk about.

The theoretical base of the informatics needs philosophical support and substantiation to become wide accepted scientific paradigm. This way, the closely scientific research in the domain of informatics would be able to leap across its boundaries and to become as elements of the scientific view of life.

Discovering the common philosophical base has exceptional importance. The philosophical rationalizing and substantiating of the information phenomena become as leading goal of the scientific knowledge.

Starting point need to be the consideration that the General Information Theory (GIT) needs to be established as internal non-contradictory system of contentions [Markov et al, 1993]. This rule contrasts the understating of the informatics as a mosaic of formal theoretical works and applications.

Basic requirement is that the GIT needs to explain the already created particular theories and paradigms.

The mathematical structures ought to serve as a tool for achievement the precise clearness of the philosophical formulations and establishing the common information language for describing and interpreting the information phenomena and processes.

The second very important requirement is to build the GIT on the base of the inceptive philosophical definition of the concept "information" using as less as possible the primary undefined concepts with maximal degree of philosophical generalization. This requirement follows the consideration that ***the concept "information" is not mathematical concept***. The behavior, peculiarity and so on could be described by the mathematical structures but this is another problem. In this case, the accent is stressed on the comprehension that the information has purely material determination and that it is a consequence of the interaction between the material objects as well as of the real processes and phenomena occurred in them and with them.

The presented in this lecture General Information Theory (GIT) is based only on primary consideration of the world as variety of entities, which are formed by relationships between entities that form lower levels.

The development of GIT had started in the period 1977-1980. The first publication, which represents some elements of GIT, was published in 1984 [Markov, 1984].

The fundamental notion of the GIT is the concept "Information". All other concepts are defined based on this definition. In 1988, the not formal definition of the concept of Information was published in [Markov, 1988]. It became as a fundamental definition for the General Information Theory [Markov et al, 1993; Markov et al, 2003a; Markov et al, 2003b; Markov et al, 2004; Markov et al, 2007].

This lecture is aimed to present the internal structure of GIT which is built by three specialized theories:

- Theory of Information,
- Theory of Infos,
- Theory of Inforaction.

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