

io-port 05495975

Artmann, S.

Some problems in organic coding theory.

Ahlswede, Rudolf (ed.) et al., General theory of information transfer and combinatorics. Berlin: Springer (ISBN 978-3-540-46244-6/pbk). Lecture Notes in Computer Science 4123, 1069-1072 (2006).

Summary: Organic coding theory describes, analyses, and simulates the structure and function of organic codes (OC), viz., of codes used in living systems as sets of arbitrary rules of encoding and decoding between two independent subsystems [*M. Barbieri*, The organic codes. An introduction to semantic biology. Cambridge: Cambridge University Press (2003)]. A very well-known example of OC is the genetic code (GC), a degenerate quaternary code of length 3 whose codewords (mRNA triplets) encode amino acids, which are component parts of the primary structure of proteins, and the beginning and end of encoding mRNA sequences. From a semiotic point of view, GC is of great interest because it breaks free from a pure symbolic way of encoding which can be characterized as resulting in codes wherein the mutual Kolmogorov complexity of the encoding and the encoded structure is nearly equal to the Kolmogorov complexity of each one of these structures [*S. Artmann*, “Using semiotics in artificial life”, in: J. Schult (ed.), Biosemiotik. Praktische Anwendung und Konsequenzen für die Einzelwissenschaften. Proceedings of a workshop held in Jena, Germany on May 16th–17th, 2002. Berlin: VWB, Verlag für Wissenschaft und Bildung. Studien zur Theorie der Biologie Vol. 6, 121–131 (2004)]. GC is analysed thoroughly since fifty years. But organic coding theory is still in its infancy. Many problems of formal, empirical, and methodological nature are open. In the following, I present three of them: the empirical problem of the evolutionary function of OCs, the methodological problem of the arbitrariness of OCs, and the formal problem of selecting an adequate model of OCs.

doi:10.1007/11889342.70