CATEGORY THEORY APPLIED TO COMPUTATION AND CONTROL

Lecture Notes in Computer Science 25, Springer Verlag, Berlin-Heidelberg-New York 1975

The book comprises most of the papers presented at the first International Symposium on the theme enunciated in the title, held in San Francisco on February 25 and 26, 1974.

The papers represent a first attempt of a symbiosis of the abstract category theory with the mathematical theories of computation and control. Several papers represent attempts at outlining the structure of the automatic mechanisms and of the recurrent computation and control schemes, from the categoristic point of view; other papers using the technique of representations study various classes of nonlinear systems representing them in other categories. Here is a brief review of some of the papers published in the volume.

"Basic Concepts of Category Theory Applicable to Computation and Control", by M. A. Anbib and F. G. Manes presents the elementary notions of the category theory, exemplifying them. In a" Control Theorist Looks at Abstract Nonsense", B.D.O. Anderson presents several cases of the applicability of the category theory in engineering.

In the article "Categorical Theory of Tree Processing" by S. Alagić it is pointed out that the fundamental algebraic structure of the ramified systems is that of a monad. In "Addressed Machines and Duality" E. S. Boinbridge points out that there is a duality relationship between two structures associated with some systems of the Turing machine type. In their article entitled "Diagram Characterization of Recursion", H. Ehrig, W. Kühnel and M. Pfender make a functional characterization of recursion, without applying to the notion of element. In "Cellular Automata with Additive Local Transition" W. Merzenich characterizes the cellular automata through semi-rings associated with them.

The book also contains a reference material compiled by F. G. Manes, comprising most of the works published in this field until 1974 inclusively.

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