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SOME ASPECTS OF NON –LINEAR DYNAMICAL SYSTEMS CARRYING NEAR-RING STRUCTURE

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Abstract: In this paper, we study large classes of nonlinear systems that admit a transfer function completely described by their input-output behavior. Our objective is to identify and analyze the aforementioned classes, which exhibit unique characteristics related to separable systems. We aim to fit certain examples of automata/dynamical systems with new concepts. We observe that for a Discrete System or Automaton, the state set forms a group. Furthermore, there exists a natural near-ring for Separable Systems. Some substructures of this near-ring are generated by *id*. and a map from state set Q to itself if the state set Q is an abelian structure. It is interesting to note that Separable Systems themselves form a near-ring with respect to parallel and series connections. We discuss certain results and provide examples to validate separable systems and the outcomes. This paper offers a theoretical and practical overview of dynamical systems in our daily lives.

Keywords and Phrases: Automata, Separable system, Transfer Function, Near-rings.

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