

Modeling and Simulation of a Micro strip Antenna in Annular Geometry

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Abstract – In the last decade, the study of multidimensional systems for signal filtering purpose has attracted the attention of many research teams, which are motivated by various interesting real world applications such Image processing, video signal filtering processing, video signal filtering Computational tomography, distributed parameters systems. The representation of the state space realization for two-dimensional (2D) filters by a transfer function, with minimal delays is a crucial problem; the minimal realization can avoid mathematical complexities as well as technical benefit to hardware requirement. Unfortunately, it is not possible to find the minimal state space realization for every 2D system other than the 1D system, but we can find it for a specific cases of all-pole or the all-zero. Lattice filter is classified as an important structure in digital signal processing. In fact, it minimizes the computation complexity, reduces the finite word length and requires less hardware compared to the direct form digital filter with similar design specifications. The authors in two delay units z^{-1} , z^{-2} are used.

In this paper we propose a new lattice-ladder structure of 2-D digital filter, composed of a delay units z^{-1} and a basic lattice section z^{-1} and z^{-2} - Using matrix representation of the basic lattice sections and we derived transfer functions of the proposed 2-D digital ladder-lattice filters. The proposed structure is composed by a minimal number of delays and a minimal number of basic lattice sections. Furthermore, we have considered the description of the proposed lattice structure by using a state-space n-D Roesser form description presented in below and the implementations suggested by the authors in literatures. Besides, the state space equations for 2-D digital filter are presented, where the dimension of the matrices of the proposed lattice structure verify the minimal state space realization. The remainder of the paper is organized as follows; first is devoted to the proposed -D lattice-ladder structure and realization and in the second is dedicated to the state space realization.

As conclusion this work has allowed us to approach a field that has experienced a great growth in recent years which is constantly evolving in order to improve, understanding and control the complex systems and processes that surround us.

Keywords – Lattice-Ladder Structure, State-Space N-D Roesser Form, Control The Complex Systems.