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Gate diffusion input (GDI) codes involved Viterbi decoders in wireless sensor network for enhancing QoS service

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Abstract
In the proposed method convolutional encoders are designed for various constraint length K 3 = to 7. Outputs of the encoders are fed as input to the decoders. Here the input message signal is taken as 16 bit which is random numbers. Design of the circuit is simulated in T-SPICE for 0.25 um and 90 nm CMOS technology with a supply voltage of 2.5 V at a frequency of 25 MHz. With a voltage level of 2.5 V and execution time of 250 ns the outputs are obtained as below. Normally the algorithm of the decoder is discussed by means of trellis diagram which has two input paths. The original input from the encoder is a (which is a1 and a2) and by introducing errors another sequence will be b (b1 and b2). The input to the decoder is 11 00 11 10 then the decoder decodes the received value and the output of the decoder will be the transmitted input 00111110. Frequencies from 15 to 25 MHz were checked, the output is optimized only at 25 MHz frequency and there are no glitches in the transitions. By comparing the experimental statistical result, the Viterbi decoder designed using GDI logic consumes less power than that of the decoder designed using CMOS circuits. Frequency is varied from 15.2 to 25 MHz randomly and there are glitches up to 20 MHz. Average power consumption of the Viterbi decoder at a frequency of 25 MHz is reduced by 29% compared to the CMOS circuits. Area of the decoder is reduced by 66% when compared to CMOS logic.

Keywords GDI codes · Power consumption · Real-time area efficiency

1 Introduction

GDI codes are displayed to accomplish the channel limit when the progressive scratch-off viterbi unraveling is utilized for endless length. They have preferable mistake remedying execution over low-thickness equality really look at codes in short code lengths system and along these lines embraced in 5G NR control channels [1]. Likewise, GDI codes are considered in many explores on correspondences frameworks. The progressive crossing out list disentangling has been proposed and accomplishes lower mistake rates than the SC interpreting. The viterbi unraveling produces equal ways as numerous as rundown size and plays out the viterbi disentangling for every way. The blunder adjusting execution of viterbi deciphering improves as the rundown size turns out to be enormous and in like manner the equipment intricacy turns out to be high. Currently, various sensors are sent in many fields to gather and communicate the encompassing information and web of things (IoT) devices are expanding in number [2]. The viterbi interpreting has a lower computational intricacy than the ordinary viterbi disentangling on the grounds that it lessens the calculations of the rehashed SC decoding by early end utilizing GDI while endeavoring to limit the arranging activities needed in the bit choice interaction to flip. It is noticed that just the slightest bit is flipped at a

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