Study of Different Performance Enhancement Technique in Communication System Exploring New Dimension.

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ABSTRACT

Digital communication plays an important role in our life. Ability to connect and communicate is the fundamental of our society. Internets, mobile communication TV, all are result of digital data communication. With the advancement of society and increasing dependency on modern amenities, demand of large amount of more accurate, fast transmitted data is day by day increasing. Hence Orthogonal Frequency Division Multiplexing plays a major role in transmitting large amount of data with better utilisation of available bandwidth. For reducing error probability in the received data, GBN-ARQ protocol is also effective.

In high speed wireless applications, Orthogonal Frequency Division Multiplexing (OFDM) is a significant approach due to of its high speed compatibility. The demand for high speed applications is increasing because of the limited bandwidth availability. The number of subcarriers is increased in OFDM due to the high data requirement and hence it made the difficult with Peak Average Power Ratio (PAPR). To attain the better results via decreasing the PAPR is the primary issue in OFDM system. In this research, a hybrid optimized PTS is initially presented to decrease the PAPR and also the data is encrypted through the DFT based chaotic sequences. A new Hybrid Whale Optimization and Moth Flame Optimization (HWOMFO) is presented in this research. It produces a weighting factor for the Partial Transmit Sequence (PTS). PTS is the primary scheme in OFDM for decreasing the PAPR with lowest distortion. The minimum performance on computational complexity and PAPR is achieved by this dissertation. The new combination of optimization approaches provides efficient combination of phase rotational factors. The new hybrid optimization gives fast convergence quality and low complex and also this combination provides better than others.

In wireless telecommunication, one of the modulation approaches used is the Orthogonal Frequency Division Multiplexing (OFDM). Moreover, the high Peak-to-Average Power Ratio (PAPR) is one notorious demerit of OFDM systems. Hence, the High Power Amplifier (HPA) is used in its linear region. Otherwise, the Bit Error Rate (BER) will be increased. Several approaches are proposed in the wireless communications for reducing the PAPR issue. A hybrid Discrete Hartley Matrix Transform (DHMT) precoding utilizing both Selected Mapping (SLM) and Partial Transmit Sequence (PTS) PAPR reduction strategies. The DHMT operation is utilized instead of Inverse Fast Fourier Transform (IFFT) operation for the multicarrier modulation process due to of its low computational complexity. Moreover, improving the physical layer security, the presented encryption system generates

chaotic sequences depends on Logistic maps and Lozi in the time-frequency domains together.

To present a newest OFDM based waveform for the fifth generation is major issue in wireless networks of the next generation. Moreover, the OFDM is affected with maximum Peak-to-Average Power Ratio (PAPR). To overcome these issues, a Twin Symbol Hybrid Optimization is presented in a basis of the Partial Transmit Sequence (TSHO-PTS) of Cyclic Prefix OFDM (CP-OFDM). Moreover, the exhaustive searching for optimal phase factors increases the computational cost of PTS. To overcome this issue, a hybrid version of Salp Swarm Optimization (SSO) and Bald Eagle Search (BES) algorithm presented to investigate the phase factor optimally by the PTS technique. Digital chaotic sequences are utilized for ensuring security at physical layer during the time of transmission of data for the Discrete Fourier Transform Spread OFDM (DFT-S-OFDM) subcarrier allocation.

The OFDM is a multicarrier modulation framework and it is utilized to transmit huge amount of information to the recipient. Moreover, the data security is challenging because of the propagation nature and in OFDM, the utmost demanding task is reduction Peak-to-Average Power Ratio (PAPR). To solve these problems, several companding and precoding processes are presented previously, but it remains with the limitations of nonlinear distortion, lesser performance, and high complexity. A new hybrid optimized PTS for decreasing the PAPR and 4D DFT based hyper chaotic sequence is utilized to encrypt the data. Furthermore, the Pseudo-Random and Inter Leaving PTS (PR-IL-PTS) sub-block partition approach is presented for improving the performance of PAPR reduction. The chaotic partition information is generated using a 4-dimension hyper chaos, and a large key space for improving the confidentiality of physical layer. An innovative Hybrid Seagul Optimization and Salp Swarm (HSOSS) Optimization is presented here to produce a phase weight factor for the PTS.

Modified Packet Combining (MPC) and Packet Reverse Packet Combining (PRPC) are inferred to provide superior throughput and correction of error for big Bit Error Rate (BER) and huge packet size. The previous researchers presented the Error Correction Code (ECC) in Automatic Repeat Request (ARQ) for large error rate of bit. But no such impressive result is available to verify this concept with respect to throughput. The presented work utilized both PRPC and MPC in a moderate manner over ordinary PRPC. Modified PRPC and MPC together are utilized and attained higher throughput and better error correction at high and

low BER for both medium and huge size of packet. Moreover, MPC with PRPC are utilized the combination of Backward Error Correction (BEC) and Forward Error Correction (FEC) Codes.