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Novel Selective Mapping with Oppositional Hosted Cuckoo Optimization Algorithm for PAPR Reduction in 5G UFMC Systems

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Saželak

In recent times, there is a continuous requirement of achieving high data rates owing to an increase in the number of devices and significant demand for various services with maximum reliability and minimum delay. It results in the development of fifth generation (5G) to offer better services with enhanced data rate. Recently, a major alternative to OFDM technology for 5G networks called universal filtered multi-carrier (UFMC) is presented where every individual sub-band is filtered that reduces the OOB radiation and eliminates guard band. But high peak-to-average power ratio (PAPR) is a crucial issue which arises from the utilization of several subcarriers to generate the time domain transmission signal. For resolving this issue, this paper presents a novel selective mapping with oppositional hosted cuckoo optimization (SM-OHOCO) algorithm for PAPR reduction in 5G UFMC systems. In the SM-OHOCO algorithm, rather than the generation of several random phase sequences, SM-OHOCO algorithm is performed iteratively to attain a better solution with few searching rounds, showing the novelty of the work. As the optimization of phase sequence in the SLM technique is considered as an NP hard optimization problem, the OHOCO algorithm is applied, which is derived by incorporating the concepts of the HOCO algorithm with oppositional based learning (OBL) strategy. To validate the effective performance of the proposed SM-OHOCO algorithm, an extensive experimental analysis is performed to highlight the improved performance in 5G networks. The resultant values pointed out the superior outcome of the proposed SM-OHOCO algorithm over the other existing methods in terms of distinct measures

Ključne riječi

metaheuristic optimization algorithm, PAPR reduction, selective mapping, universal filtered multi-carrier, 5G networks

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