

Filter Optimizing and Maintaining Multi-Rate Processing Using an Optimized Universal Filtered Multi-Carrier (OUFMC) with Cascaded Integrator–Comb (CIC) Filter

Mobile tele-communication plays an important role for transmitting information such as data, images, videos and voice between places. For this purpose, a telecommunication process was introduced with different network generations. Among these various generations, the 5G-based information transmission process improves the overall communication process because it overcomes spectral efficiency issues by utilizing effective modulation techniques. This paper examines the optimized Universal Filtered Multi-Carrier (OUFMC) based modulation technique for improving the communication process. Along with the OUFMC technique, a cascaded integrator–comb (CIC) filter was utilized for maintaining multi-rate processing and computational efficiency. This optimized technique effectively reduces the signal over out-of-band leakage ratio and the distortion over out-of-band leakage ratio. Finally, this paper presents the excellence of the system as evaluated through experimental results.