

MULTIRATE DIGITAL SIGNAL PROCESSING SYSTEM FOR DIGITAL COMMUNICATION

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Abstract

Multirate interpolation and decimator systems are building blocks commonly used in digital signal processing not only for analysis and generation of the various signals but also for processing of this signals through various modes of operation. The use of multirate concepts using interpolation and decimation is that to increase or decrease the clock rate or signal rate of the signal used for processing and manipulation of the various signals. In recent trends multirate system are rapidly used for the modern communication technology.

While the multirate DSP in the aforementioned communication systems serves to provide additional degrees of freedom in the design of the receiver, another important class of multirate structures is used at the transmitter side in order to introduce the redundancy in the data stream. This redundancy generally serves to facilitate the equalization process by forcing certain structure on the transmitted signal. If the channel is unknown, this procedure helps to identify it; if the channel is ill – conditioned, additional redundancy helps avoid severe noise amplification at the receiver, and so forth. In the second part focus on this second group of multirate systems, derive some of their properties and introduce certain improvements of the communication systems.

Keywords : Multirate, Decimation, Interpolator, Polyphase decompositon.