Active Noise Cancellation in a Wireline Telemetry System

Michael Kuei-Che Cheng
Department of Electrical and Computer Engineering
The University of Texas at Austin
Austin, Texas 78712
kcheng2@ece.utexas.edu
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Abstract

This paper discusses a noise cancellation algorithm that reduces periodic in-band noise generated by crosstalk between the power and data cable of a multiconductor channel in a wireline telemetry system. The idea of noise cancellation is to collect an estimation of the periodic in-band noise during receiver training. The collected noise estimate is then subtracted from the received Quadrature Amplitude Modulation (QAM) signal during steady state data transmission, hence improving the system's noise performance. Specification of the noise cancellation algorithm is accomplished through the use a homogeneous synchronous dataflow (HSDF) graph and implementation of the scheme is achieved on an embedded DSP processor. Active Noise Cancellation is an effective approach in cases where traditional frequency domain filters are not useful.