

Embedded fuzzy control for automatic channel equalization after digital transmissions

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RESUMEN

A straightforward technique for automatic adaptation of channel equalizers after digital data transmission is presented. Inter-Symbol Interference (ISI) at the received signal is identified by scanning the input stream over time at the data clock frequency. The resulting 2D-figure is compared against an ideal opened Eye Pattern encoded into a two-input one-output analogue Fuzzy Inference System. Any deviation from the reference eye results in an error-signal used to properly locate the symmetric zeros of an analogue amplitude-equalizer biquad gm-c filter intended for the inversion of the channel transfer function. The adaptation can work on-line during transmission and no reference signal is required. The presented methodology was validated by simulations for cable equalization wherein the controller as well as the filter were modeled with their actual measured features drawn from a fabricated CMOS prototype. The system shows self-adapting capabilities for diverse cable length settings and the ISI is removed in all cases.

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